



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

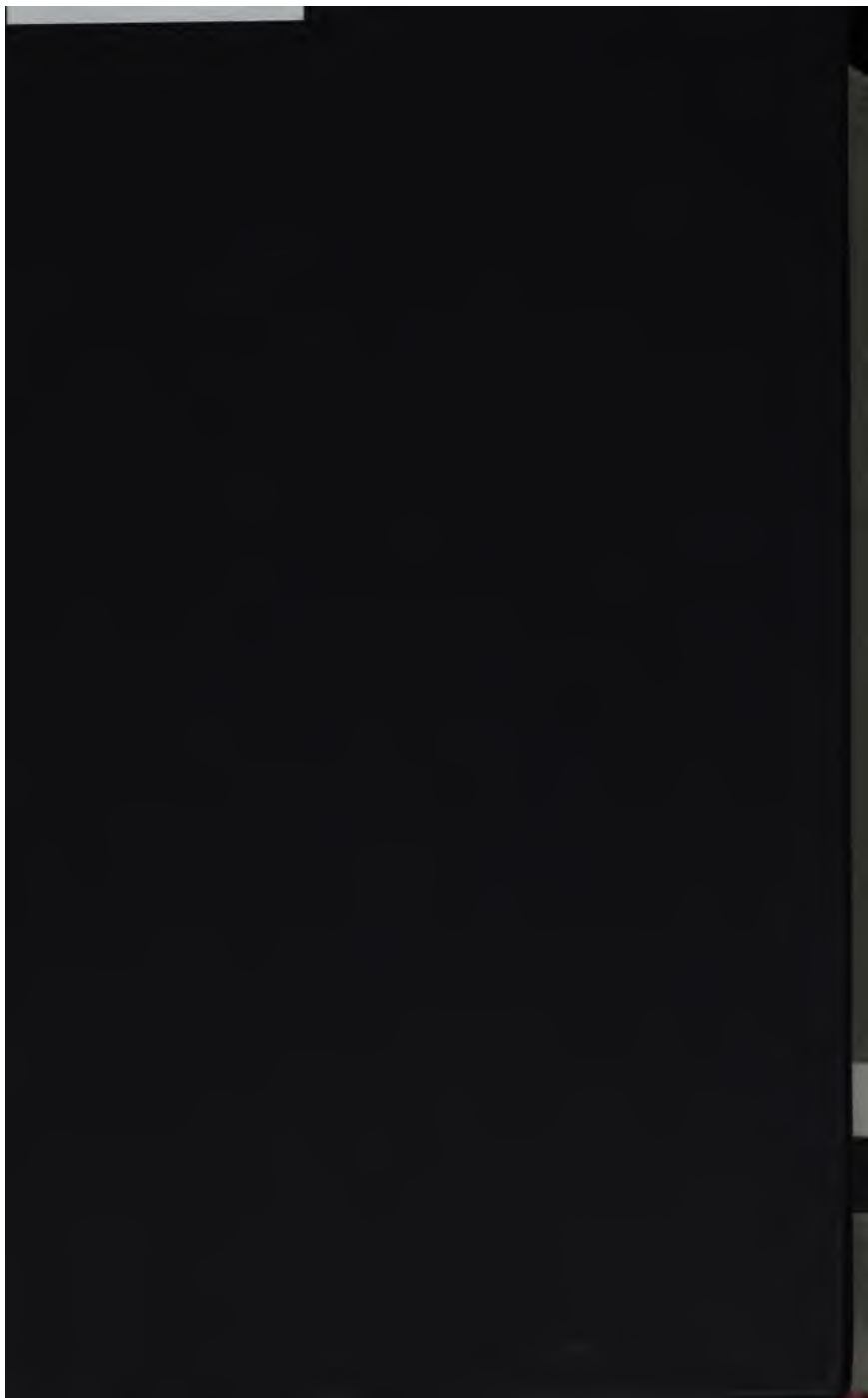
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

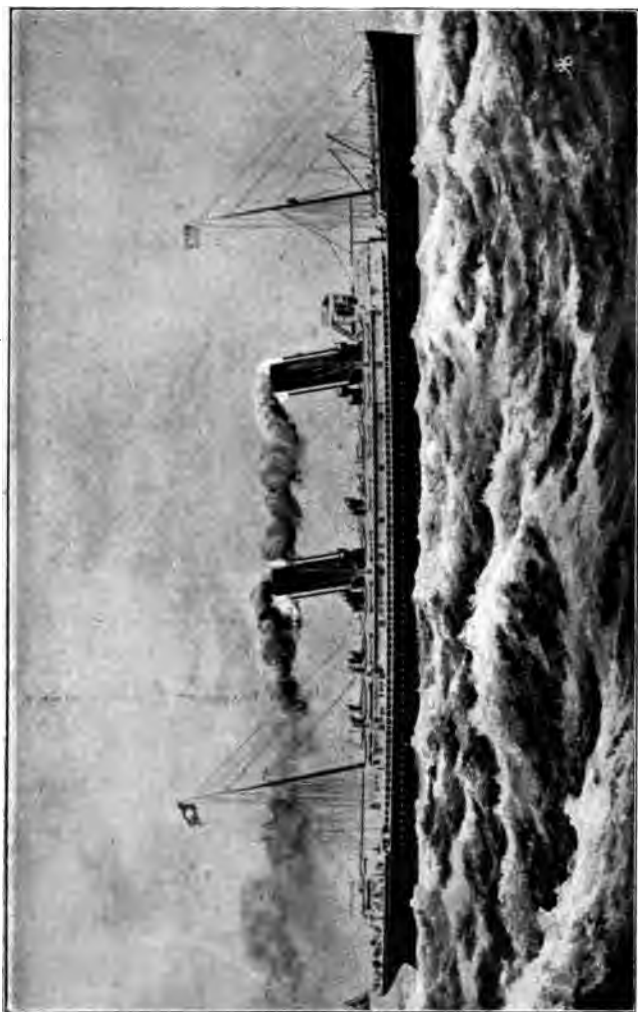
Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>





THE HISTORY
OF
NORTH ATLANTIC STEAM NAVIGATION

1



"LUCANIA."

1

THE HISTORY OF NORTH ATLANTIC STEAM NAVIGATION

*WITH SOME ACCOUNT OF EARLY SHIPS
AND SHIPOWNERS*

BY

HENRY FRY

EX-PRESIDENT OF DOMINION BOARD OF TRADE OF CANADA
AND LLOYD'S AGENT AT QUEBEC.

"They that go down to the sea in ships, that do business in great waters; These see the works of the Lord, and his wonders in the deep. For he commandeth and raiseth the stormy wind, which lifteth up the waves thereof. . . . He maketh the storm a calm, so that the waves thereof are still. Then are they glad because they be quiet, so he bringeth them unto their desired haven."—*Psalm* cvii. 23-30.

WITH OVER FIFTY ILLUSTRATIONS, OF SHIPS
AND PORTRAITS OF OWNERS

53.870-7

LONDON
SAMPSON LOW, MARSTON AND COMPANY
LIMITED

St. Dunstan's House
FETTER LANE, FLEET STREET, E.C.

1896

Transportation
Library

VM
615
.F95

LONDON:
PRINTED BY WILLIAM CLOWES AND SONS, LIMITED,
STAMFORD STREET AND CHARING CROSS.

Transport.

PREFACE.

THE following pages were originally written, for private circulation only, during a period of enforced leisure from ill-health. They have been revised for publication at the earnest request of a few old friends of the Author interested in steam shipping.

The only merit claimed for them is that of accuracy, to attain which the greatest pains have been taken.

Having been present at the launch of the first steamship built for the North Atlantic trade, the *Great Western*, in 1837, and that of the first ocean screw steamship, the *Great Britain*, in 1843, and having watched every Atlantic steamship with the deepest interest for fifty-six years, during which he has crossed the Atlantic thirty-seven times in various lines, the Author trusts he may not be considered open to the charge of presumption in thus acceding to the wishes of his friends.

His acknowledgments for valuable assistance are due to Andrew Allan, Esq., of Montreal; the Cunard Steamship Company of Liverpool; Clement A. Griscom, Esq., of Philadelphia, U.S.; Sir Edward J. Harland, Bart., M.P. for Belfast; Eugene T. Chamberlain, Esq., of Washington, U.S., Commissioner of Navigation; The Hamburg-American Packet Company of Hamburg; The North German Lloyd Company of Bremen; George Johnson, Esq., head of the Statistical

MS. 2026

Department at Ottawa ; Mark Whitwill, Esq., of Bristol ; Archibald Campbell, Esq., of Quebec ; and the Sampson Low, Marston & Co., Limited, of London.

He has also consulted 'The History of Merchant Shipping and Ancient Commerce,' by the late W. S. Lindsay, of London ; 'The Atlantic Ferry,' by A. I. Maginnis, M.I.N.A., of Liverpool ; 'Our Ocean Railways,' by A. Fraser-Macdonald ; and 'The Mercantile Navy List,' published by Lloyds.

BELMONT, SWEETSBURG, QUE.

September, 1895.

CONTENTS.

CHAP.	PAGE
I.—EARLY NAVIGATORS	1
II.—EARLY SAILING SHIPS	16
III.—HISTORY OF THE MARINE STEAM ENGINE	25
IV.—THE STEAMBOAT IN CANADA	31
V.—EPOCHS IN ATLANTIC STEAM NAVIGATION	32
VI.—SPEED CALCULATIONS.	54
VII.—THE CUNARD LINE AND ITS COMPETITORS	55
VIII.—THE INMAN LINE	112
IX.—THE ALLAN LINE	138
X.—THE WHITE STAR LINE	161
XI.—THE EASTERN STEAM NAVIGATION COMPANY	182
XII.—THE ANCHOR LINE	187
XIII.—THE ROYAL ATLANTIC STEAM NAVIGATION COMPANY	190
XIV.—THE NATIONAL STEAM NAVIGATION COMPANY	192
XV.—THE GUION LINE	195
XVI.—THE DOMINION LINE	198
XVII.—THE BEAVER LINE	204
XVIII.—THE HAMBURG-AMERICAN PACKET COMPANY	207
XIX.—THE NORTH GERMAN LLOYD COMPANY	226
XX.—LA COMPAGNIE GÉNÉRALE TRANSATLANTIQUE	242
XXI.—THE NETHERLANDS LINE	250
XXII.—THE RED STAR LINE	251
XXIII.—THE AMERICAN LINE	253
XXIV.—THE CANADIAN PACIFIC LINE	254
XXV.—THE DONALDSON LINE	259
XXVI.—THE "THOMSON" LINE	261

CHAP.	PAGE
XXVII.—THE TEMPERLEY-ROSS LINE	263
XXVIII.—VARIOUS LINES :—	
The Boston Line	264
The American Steamship Company	264
The Great Western Line	264
The South Wales Line	265
The State Line	265
The Warren Line	265
The Wilson Line	265
The Leyland Line	265
The Bristol City Line	266
The Thingvalla Line	266
The Johnston Line	267
The Monarch Line	267
The Hill Line	267
The Atlantic Transport Line	268
The Manhasset Line	268
The Lord Line	268
The Ulster Company	268
The Furness Line	268
The Union Line	268
The Nouvelle Compagnie Bordelaise.	268
The Marseilles Line	269
The Fabre Line	269
The Italian Line	269
The Portuguese Line	269
The Empresa Insulano Line	269
The Neptune Line	269
The Chesapeake and Ohio Line	269
The Petroleum Line	269
Norwegian Boats	269
XXIX.—THE WORLD'S TONNAGE	270
XXX.—BRITISH SEAMEN	273
XXXI.—AMERICAN SHIPBUILDING.	277
XXXII.—CONCLUSION	284

APPENDICES.

NO.	PAGE
1. CUNARD REPORT, 1894	289
2. UNITED STATES TRADE WITH GREAT BRITAIN (<i>Boston Herald</i>)	290
3. OCEAN TRAVEL IN 1894 (<i>New York Post</i>)	291
4. ENGLAND'S COMMERCE (<i>Boston Globe</i>)	292
5. THE "TURRET" BOATS (<i>Montreal Star</i>)	295
6. PASSAGE RATES	297
7. BATTERSBY'S REGISTER	302
8. A MONTH'S SAILINGS (New York and Montreal)	306
9. PRESENTATION TO CAPTAIN MURRELL	309
10. BILLS OF FARE	310
11. "LUCANIA'S" GREAT RUN	311
12. IMPROVED TRAIN SERVICE AT LIVERPOOL	312
13. POOR STEAMSHIP BUSINESS	312
INDEX	315

LIST OF ILLUSTRATIONS.

	PAGE
"LUCANIA" <i>Frontispiece</i>	
A GENOESE CARRACK	2
VASCO DE GAMA'S "SAN GABRIEL" ROUNDING THE CAPE OF GOOD HOPE	5
HON. EAST INDIA COMPANY'S SHIP "EARL OF BALCARRAS," 1417 TONS, 26 GUNS.	19
"GREAT WESTERN"	39
"GREAT BRITAIN" IN A GALE OFF LUNDY ISLAND.	43
COMPOUND ENGINE.	48
SIR S. CUNARD, BART.	56
SIR GEORGE BURNS, BART.	57
DAVID MACIVER	58
"BRITANNIA"	59
HON. JOSEPH HOWE	61
"EUROPA"	63
"ASIA"	67
COLLINS SS. "ATLANTIC"	69
"PERSIA"	71
"SCOTIA"	75
"BOTHNIA"	79
"GALLIA"	83
"SERVIA"	87
"ETRURIA"	91
"CAMPANIA" ON THE STOCKS.	96
"CAMPANIA'S" SALOON	99
"CAMPANIA'S" LIBRARY	103
"CITY OF LONDON"	114

	PAGE
C. A. GRISCOM, ESQ.	115
"PARIS"	117
TRIPLE CYLINDER ENGINE	120
"NEW YORK" MAIN DINING SALOON	123
"CITY OF NEW YORK" TWIN SCREWS	125
"ST. LOUIS"	129
SIR HUGH ALLAN	139
"MORAVIAN"	141
"SCANDINAVIAN"	147
"PARISIAN"	151
SIR E. J. HARLAND, BART., M.P.	162
"OCEANIC"	163
"BRITANNIC"	167
"TEUTONIC"	171
"MAJESTIC" SALOON	173
"MAJESTIC" LIBRARY	174
"MAJESTIC" SMOKE-ROOM	175
"GREAT EASTERN"	183
"VANCOUVER"	199
"COLUMBIA"	209
"FÜRST BISMARCK"	213
"FÜRST BISMARCK'S" SALOON	217
"FÜRST BISMARCK'S" CHAMBRE DE LUXE	221
"HAVEL"	227
"HAVEL" SALOON	231
"LA TOURAINE"	245
"EMPRESS OF INDIA"	255
THE LATE WILLIAM CRAMP	280
"THERMOPYLÆ"	293
"GREAT REPUBLIC"	299

MAP.

ROUTE CHART OF ATLANTIC.

THE HISTORY

OF

NORTH ATLANTIC STEAM NAVIGATION.

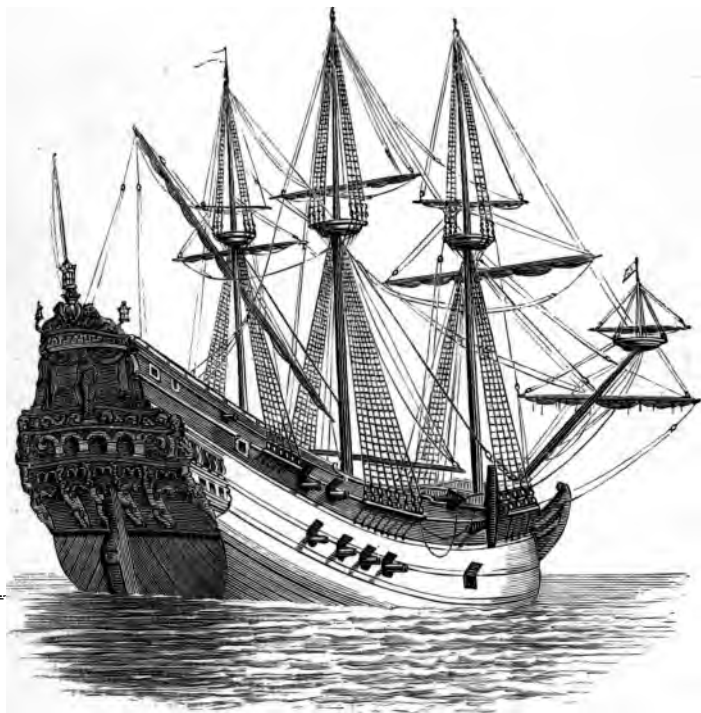


CHAPTER I.

EARLY NAVIGATORS.

THE close of the 15th, and the early part of the 16th, centuries, seem to have developed a sort of furore for maritime discovery. The Venetians and Genoese had long enjoyed a supremacy in maritime trade, and both had grown immensely wealthy. In A.D. 1202 the Venetians supplied shipping to convey the Crusaders on the fourth crusade, carrying no less than 4500 knights and 20,000 foot, with horses and provisions for nine months, but they made most exorbitant demands in payment, and their galleys secured the lucrative commerce of Greece and Egypt. During the 12th and 13th centuries the commerce of Europe was almost entirely in the hands of the Italians, more commonly known as "Lombards." They became the carriers, the manufacturers, and the bankers of all Europe. The Genoese, however, surpassed the Venetians in the art of shipbuilding, and they were, so far as can now be traced, the first to construct a ship approaching to the modern form and rig. In the first half of the 16th century some of their carracks are said to have been of no less than 1500 tons burthen. They were, too, as skilful and even more daring in the management of them than the Venetians. Pisa, one of the most ancient cities of Tuscany, proved in some respects a formidable rival to both the Venetian and Genoese traders; Tuscany became one of the most distinguished commercial states of Italy; the merchants of Florence established branch houses in distant foreign countries, and became very rich. Quarrelling with the Pisans the

Florentines purchased the port of Leghorn from the Genoese, and this acquisition rendered Florence one of the richest cities in Italy, and her commerce gradually equalled, if it did not surpass, that of Venice. Her merchants were princes. The Medici alone had at one time sixteen banking establishments in different parts of Europe. In A.D. 1329 the whole of the customs of England



A GENOESE CARRACK.

were farmed to the great commercial house of the Bardi at Florence. The trade with the East was opened in a measure by Cosmo de Medici, and was greatly extended and improved by his illustrious grandson Lorenzo.¹ She opened up a large trade with Spain and England, and her policy was far more liberal than that of Venice.

¹ See Roscoe's 'Life of Lorenzo de Medici.'

Many eyes were now turned to the East as the source of fabulous wealth. Hitherto it had only been known by the way of the Red Sea and the caravans which crossed the great desert. In the days of Solomon we learn that : "Every three years once came the ships of Tarshish bringing gold and silver, ivory and apes and peacocks" (2 Chronicles ix. 21).

The Portuguese were the first to attempt a passage by sea. The initiatory steps for the accomplishment of this great purpose were taken by Prince Henry of Portugal, who, on that account, was appropriately called "the navigator." He was the fifth son of King Dom John I. ; his mother was an English Royal lady, the daughter of John o' Gaunt, and he was therefore the nephew of King Henry IV. of England, and grandson of Edward III. Prince Henry was a most enlightened prince, fond of mathematics and navigation, and long meditated voyages of discovery. In 1417 two very indifferent vessels were sent South, but returned unsuccessful. In 1418 they discovered Madeira by accident, but it was only in 1441 that Cape Blanco was reached. Cape de Verde Islands were discovered in 1446, and the Azores in 1449 or 1457. In 1471 the Equator was first passed, and in 1481 a fort and trading-station were established on the coast of Guinea. Dom John II. was also conspicuous for maritime enterprise. In 1487 Diaz discovered the Cape of Good Hope, but proceeded no further, and perished in a storm in 1500.

Vasco de Gama, another Portuguese, sailed from Lisbon 9th July, 1497, with four vessels, reached the Cape and Eastern Africa early in 1498, and Calicut, on the Malabar coast, in May, and returned to Lisbon in 1499. He sailed on his second voyage in 1502 with twenty ships, was patronised by the King, and blessed by the Church ; made a third voyage as "Viceroy of India," and died at Cochin in 1525.

Columbus, a noble-minded man, and a few others, conceived the idea that "Cathay," or India, could be reached by sailing west. Columbus was born at Genoa in 1437, and after vainly seeking aid from his native province, Portugal and England, entered the service of Ferdinand and Isabella of Spain, who equipped three ships, and he sailed from Palos in August 1492. Being unacquainted with the variation of the needle, he went south, and discovered one of the Bahama Islands in October, and afterwards Hispaniola, but it was only on his third voyage in August, 1498, that he discovered the mainland of America, and, after cruel treatment from his enemies, died at Valladolid in 1506.

Amerigo Vespucci was also an Italian, having been born at

4 THE HISTORY OF NORTH ATLANTIC STEAM NAVIGATION.

Florence in 1451, and from him it is supposed America took its name. He went to Spain and met Columbus at Seville, when the latter was preparing for his second voyage. Amerigo sailed with Hojeda, a Spaniard, as pilot in 1499, and on his return entered the service of Portugal; sailed on his second voyage in 1501, and third in 1503, discovering All Saints Bay in Brazil, and then re-entered the service of Spain as master-pilot, and died in 1516.

Magellan (or Magalhaens), a Portuguese, did not discover the strait named after him until 1519, when in the service of Charles V. of Spain, on his way to the Moluccas, and was killed at the Philippine Islands by natives in 1521.

In the meantime, Cortez, a Spaniard, born in 1485, had visited Cuba in 1511 with Velasquez, and in 1518 commanded an expedition to Mexico, where he seized Montezuma, overran the country, perpetrated horrible cruelties, returned to Spain, and died in 1554.

Pizarro and Diego d'Almagro, both Spaniards of the lowest character, reached Panama in 1524, and accompanied by Lucque, a priest, visited Peru, and murdered Athualpa, the last of the Incas, in 1531. Pizarro founded Lima in 1535, murdered Almagro in 1537, and was himself assassinated in his own palace at Lima in 1541.

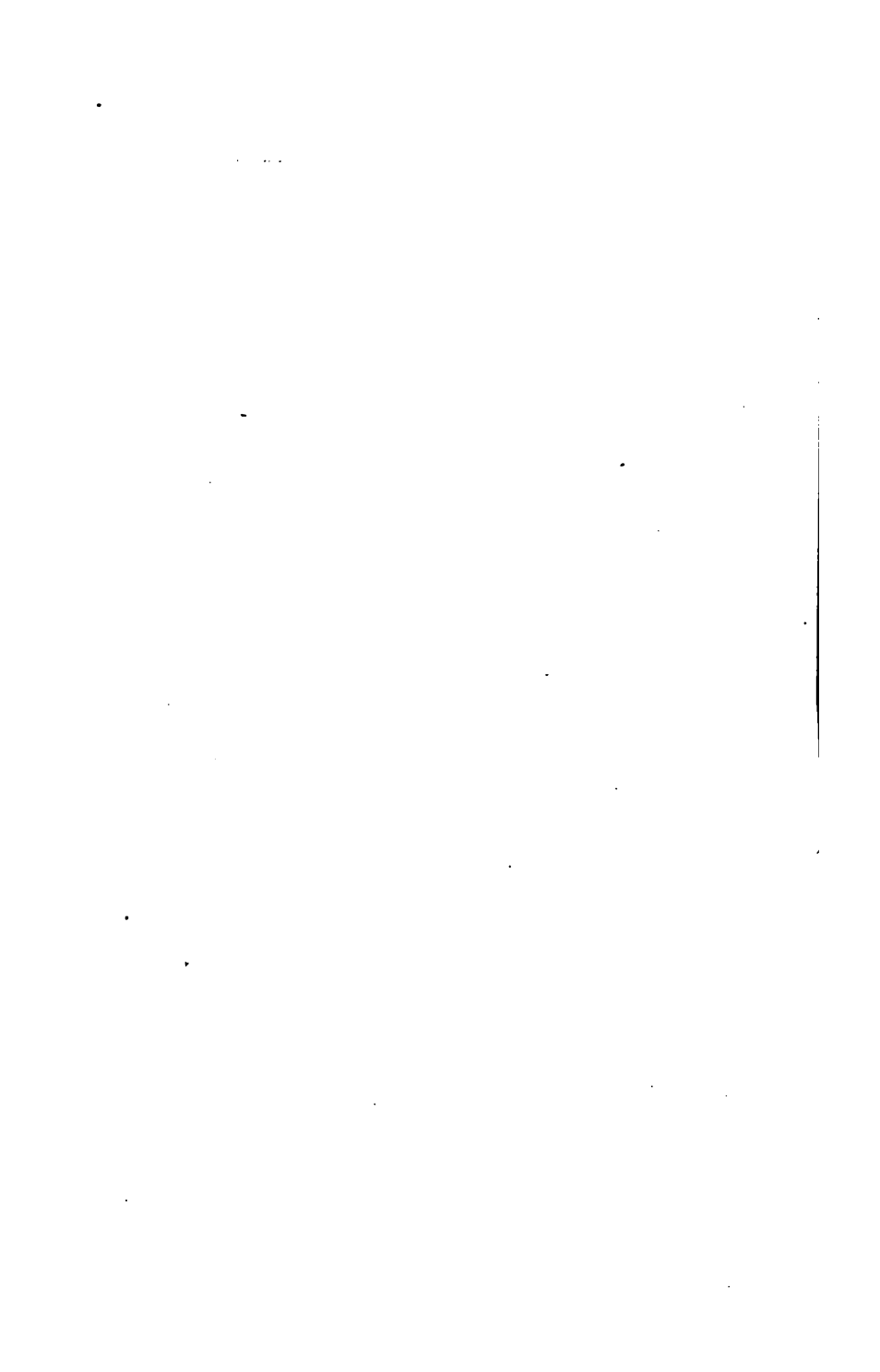
Jacques Cartier, a Frenchman, did not leave St. Malo until 1534, and entering the St. Lawrence, discovered the Island of St. John (now Prince Edward), Bay de Chaleurs, Quebec, and Montreal; but Cortereal is said to have touched at Labrador in 1500, calling the land "Terra Verde," and to have entered the Gulf of St. Lawrence and touched Acadian shores. Seryet de St. Just was also in Canadian waters in 1518, and in 1527. Thomas Thorne, of Bristol, is also said to have visited them, but how far to the west is not known.

Sir John Hawkins (born in Devon, 1521), Sir Francis Drake (born in Devon, 1545), and Sir Walter Raleigh (born in Devon, 1552), were, after Cabot, the most celebrated English navigators of the 16th century. All three took part in the defeat of the Spanish Armada in 1588. Hawkins was a most intrepid, daring man, serving principally in the West Indies, but disgraced his name and country by carrying slaves from Africa to the West and selling them. He died in 1595.

Drake's career was a marvellous one. His first voyage was to the West Indies in 1570. He afterwards fitted out three frigates at his own expense and sailed on his celebrated voyage round the world in 1577 with five small ships; reached Lat. 48° N. (near



VASCO DE GAMA'S "SAN GABRIEL" ROUNDING THE CAPE OF GOOD HOPE.



British Columbia), thence to the East Indies, doubled the Cape of Good Hope, and returned to Plymouth in 1580, after capturing many Spanish galleons ; visited the West Indies in 1585, capturing many places and ships ; he entered Cadiz in 1587 with thirty sail and destroyed the shipping there, and died at sea in 1596.

Raleigh, after serving in France, the Netherlands, Newfoundland, and Ireland, founded Virginia and Guiana, fell into disgrace and was confined in the Tower of London for twelve years ; was then released and returned to Guiana, but was cruelly beheaded by King James I. in 1618.

Tasman (Abel Jan) was a Dutch navigator who made many important discoveries in the South Seas in the 17th century ; he discovered New Zealand in 1642, but did not land. In the same year he discovered Van Diemen's Land (now named Tasmania, after him).

Dampier, who published his celebrated 'Voyages round the World,' in four volumes, was only born in Somerset in 1652, and died in 1712.

James Cook, another celebrated English navigator, was born in Yorkshire in 1728, and was present at the capture of Quebec in 1759, in the *Mercury* ; was afterwards made lieutenant, and made his well-known voyages in the South Seas (the account of which was edited by Dr. Kippis), exploring New Zealand, etc., and was killed by natives at Owyhee in 1779. He was the first to land in New Zealand, 8th October, 1769, near Gisborne.

George Vancouver served with Cook, endeavoured to find a passage from the North Pacific to the North Atlantic, and published an account of it. Died in 1798. Behring was a Dane in the service of Russia in Northern Seas, and perished on a desolate island in Behring's Straits in 1741.

This preliminary sketch of early navigators will suffice to prepare the way for the claim made on behalf of Sebastian Cabot, a native of Bristol, England, one of the noblest seamen that ever trod a ship's deck : not only a brave and skilful sailor, but a man of considerable scientific attainments for his age, and withal, a man of eminent piety. That claim is that Cabot, and not Columbus, was the real discoverer of the Continent of America. Now for the proofs.

Sebastian Cabot was the son of John Cabot, a skilful Venetian pilot who had settled in Bristol, where Sebastian was born in 1475, or, according to some authorities, in 1477.¹ The street where he

¹ Some authorities say Sebastian was born in Venice.

resided was, and is still, called Cathay, and is well known to the writer by that name. It is near the celebrated St. Mary Redcliff Church.

The early voyages of the Cabots are wrapped in doubt owing to the mysterious disappearance of Sebastian's 'Mappes and Discourses,' to which he refers. Sebastian held the same view as Columbus, that Cathay could be reached by the N.W., and all his early voyages took that route.

The first record of the family is that John Cabot, a Venetian, was made a citizen of Venice in 1476. There is some doubt as to whether John made any voyage of discovery himself, and one writer affirms that he did not. The weight of evidence, however, is in favour of his having, at least, performed the first authentic voyage with Sebastian, and it is generally admitted that he died in 1498, before the second expedition sailed. The fame of John, however, has been eclipsed by that of his illustrious son Sebastian, whose career I propose to trace.

On a map of Sebastian's travels, preserved in the Bibliothèque de Paris, dated 1544, it is stated in Latin and Spanish that "John and Sebastian Cabot together discovered the new land on June 24th, 1494" (probably an error for 1496), and that Cabot himself "made this figure extended in plane. . . ." In confirmation of this, it is stated in the first volume of 'Spanish State Papers,' under date July 25th, 1498: "The people of Bristol sent out every year two or three light ships in search of the island of Brazil and the seven cities, according to the fancy of that Italian Cabot; and they have done so for the last seven years." Whatever may have been the character and results of these early voyages, we have no well authenticated account of them until 1496, when King Henry VII. of England granted, on the 5th March, a patent to "John Cabot, a Venetian by birth, who had settled at Bristol, and to his three sons, Lewis, Sebastian, and Sanctus, giving them authority to sail to all parts, countries, and seas of the East, of the West, and of the North, under our banner and ensign, with four ships of what burden or quantity so ever they be, and as many marines or men as they will have with them in the said ships upon their own proper costs and charges."¹ They were also to enjoy the privilege of exclusive resort and traffic to all places they might discover, reserving one-fifth of the clear profit of the enterprise to the Crown. There has been much dispute as to the date of Cabot's first authentic voyage, whether it took place in 1496 or 1497. Many of

¹ 'Rymal' (Fœdera), vol. xii. p. 595.

the accounts, too, evidently confuse the record of his first voyage with the second, made in 1498 or 1499.

The highest English authority on these early voyages is Richard Hakluyt, born at Eyton, Herefordshire, in 1553. He was prebendary of Bristol Cathedral, and afterwards rector of Wetheringset. He wrote 'Voyages and Discoveries of the English Nation' in three volumes, a most valuable and trustworthy work. He says :—

"A great part of the continent of America, as well of the islands, was first discovered for the King of England by Sebastian Gabote, an Englishman, born in Bristowe, son of John Gabote, in 1496; nay more, Gabote discovered this large tracte of prime lande *two years before Columbus saw any part of the continent.*"

And again :

"All that mighty tracte of lande from 67 degrees N., to the latitude almost of Florida, was first discovered out of England by the commandment of Henry VII."

And again :

"He" (Cabot) "sailed so far toward the west that he had the island of Cuba on his left hand in manner in the same degree of longitude."

Mr. Gerald E. Hart of Montreal, a student of Canadian history, who owned a valuable library of historical books, says : "An analysis of the evidence of old maps and documents convinces me that Cabot sailed from Bristol in 1496, and was consequently the real discoverer of the continent of North America." Mr. Hart also advanced authorities to show that to the discovery of the island by Cabot and his English squadron, was due the name of Cape Breton. England had not then lost her old name of Britannia, and in Spanish manuscripts of the time her people were called "Bretons."

Rev. Mr. Harvey, author of the 'History of Newfoundland,' says :—

"The most reliable account of Cabot's first voyage is contained in a letter of Lorenzo Pasqualigo, Venetian Ambassador in London, addressed to his brother, and preserved in the 'Calendar of Venetian State Papers.' It is dated London, August 23rd, 1497, and contains the following remarks :—

"The Venetian, our countryman, who went with a ship from Bristol in quest of new islands is returned, and says that 700 leagues hence he discovered land, the territory of the Grand Cham. He coasted for 300 leagues and landed. He was three months on the voyage, and on his return he saw two islands to starboard, but would not land, time being precious, as he was short of provisions. The king has also given him money wherewith to amuse himself till

then (spring of 1498), and he is now at Bristol with his wife, who is also a Venetian, and with his sons. His name is Juan Cabot, and he is styled 'The Great Admiral.'

Rev. Dr. Howley of Newfoundland, quotes a letter from Don Raimondo Soncini, envoy of the Duke of Milan at the court of Henry VII., who was well acquainted with the Cabots, to the same effect. Mr. Harvey also quotes Hakluyt (vol. iii., p. 27) :

"In the year of our Lord 1497, John Cabot, a Venetian, and his son Sebastian (with an English fleet set out from Bristol), discovered that land which no man before that time had attempted, on the 24th June, about 5 o'clock in the morning. This land he called 'Prima Vista,' that is to say, 'first seen.' That island which lieth out before the land he called the Island of St. John, upon this occasion, as I think, because it was discovered upon the day of John the Baptist."

Mr. Harvey holds that "Prima Vista" was Cape North in Cape Breton, and that Cabot did not discover Labrador until his *second* voyage.

Here note, 1st. Pasqualigo does not say that the round voyage only occupied three months. He probably meant the outward voyage, as the vessel was small.

2nd. If he coasted 300 leagues it is highly improbable that he could have made the *round voyage* in three months. His sighting the two islands too (doubtless the Azores), proves that he had gone south from "Prima Vista."

3rd. *He was short of provisions* when he sighted the Azores, and it is not at all likely that this would be the case if he had only been absent from Bristol less than three months.

4th. If he only discovered land on the 24th June, 1497, it is hardly possible that he could have been back in Bristol before August 10th, when we know the king gave him £10 from the privy purse.

5th. As the patent was granted on the 5th March, 1496, it is not likely that Cabot delayed sailing for fourteen months, nor that if he only left Bristol in May, 1497, he could have been back previous to August 10th.

On the whole, I come to the conclusion that John and Sebastian left Bristol in the ship *Matthew* of 200 tons in 1496, and discovered Cape Breton on June 24th; that he proceeded south, coasting along the continent, and returned to Bristol early in 1497. Columbus only sighted the mainland of America on the 1st August, 1498, on this third voyage, having discovered one of the Bahama Islands in 1492.

It is clear therefore that Cabot is entitled to the honour of being *the first to rediscover that portion of the continent now known as the United States of America*. Also that he discovered what is now known as part of Canada, *at least 38 years before Cartier entered the St. Lawrence*. Cartier did not leave St. Malo until 1534. He is no doubt entitled to the merit of *exploring* the St. Lawrence and to have discovered Quebec and Montreal. Moreover, on the same day that Cabot discovered "Prima Vista," he discovered St. John Island near Cape Breton, but, which some writers say may have been either Prince Edward, or Newfoundland. As to the term "New-found-land," it must be remembered that all the "newland" discovered at that time was so named, and Cabot himself could not have been aware that what we now know as "Newfoundland" was an island.

I say rediscovered, because if the Icelandic "Sagas" are to be believed, Greenland was discovered by Icelanders in A.D. 982 and the continent of America in A.D. 1000. In the royal library at Copenhagen a richly illuminated MS., the 'Codex Flateyensis,' contains the history of "Eric the Red," and of his son "Leif the Happy." It was written by two monks at Flatoë in Iceland, in two volumes, on fine parchment, between A.D. 1370 and A.D. 1380. It states that both father and son left Iceland in A.D. 982, and, sailing west, discovered Greenland. Leif returned to Iceland, and went thence to Norway, where he was persuaded by King Olaf Trygfesen to embrace Christianity and go back as its missionary to this newly discovered country. When on his voyage there he was driven by adverse winds to the coast of America, as far south, it is believed, as Massachusetts, designated in the Codex "Vinland," or "Wineland," probably because Lief and his companions had found wild grapes growing in abundance there. There is a tradition too in Iceland that Columbus, hearing of these "Sagas," visited Iceland in 1477, and Icelanders point out with pride the very spot where he landed.¹

A second patent was granted to Cabot by the king in 1498, the school-books say on the 3rd February, but Biddle (in his 'Life of Cabot') says he discovered the original in the Rolls Court, London, and that it was dated 3rd July, 1498. An expedition of three hundred men was fitted out, and the merchants of Bristol sent small stocks of goods. Cabot brought back "hawkes," "wild cattles," and "poppingays." On this second authentic voyage Cabot appears to have gone further north, and to have met much ice, but

¹ 'Our Ocean Railways,' by A. Fraser-Macdonald.

there is some doubt as to whether it occurred in 1498 or 1499. The records of the city of Bristol have this entry in 1499:—

"This year Sebastian Cabot born in Bristoll, proffered his services to King Henry for discovering new countries, which had no greate or favourable entertainment of the King, but he, with no extraordinary preparation, set forth from Bristoll, and made greate discoveries."¹

If the second patent was only granted on the 3rd July, 1498, it seems probable that Cabot's second voyage only occurred in 1499. Kohl, the German geographer, says, "The Portuguese Galvano, one of the original and contemporary authorities on Cabot's voyage of 1498, says, that having reached Lat. 60° N., he and his men found the air very cold, and great islands of ice. Then they sailed back again to the south." Peter Martyr, as quoted by Zeigler, said that "Cabot sailing continually from England towards the N., followed the course so far that he chanced upon great flakes of ice in the month of July, and, keeping clear of these, he followed the coast by the shore, bending towards the S." Ramusio in the preface of the third vol. of his 'Voyages,' says, "Cabot had written to him that he had reached 67½° N. Lat., and he speaks of its general sterility and abundance of Polar bears." Mr. Harvey insists that all three refer to the *second* voyage and not to the *first*, when no mention is made of ice. Navarette, in describing from the records in the Spanish archives the voyage of Hojeda, who sailed from Spain 20th May, 1499, says, "What is certain is that Hojeda in his first voyage found certain Englishmen in the neighbourhood of Caqaibaco." Where this was is not clear, but it would seem that Cabot must either have made his second voyage in 1499, or have left a small colony out of the three hundred men he took with him.

In 1501 Henry VII. granted a third patent to three merchants of Bristol and three Portuguese to proceed in search of lands, and in 1502 a fourth, but no mention is made of Cabot, and we lose sight of him for some years. The disappearance of Cabot's "mappes and discourses," which he had prepared for publication, may account for his having been unnoticed. In Peter Martyr's testimony to Cabot he says, "Cabot did not leave England till after the death of Henry VII. in 1509."²

In 1512 Cabot entered the service of Spain and resided at Seville. In 1515 we find him "a member of the Council of the Indies," with expectation of commanding an expedition to India, but the death of King Ferdinand in 1516 caused Cabot to return to

¹ Seyer's 'Memoirs of Bristol,' p. 11.

² 'Decades' 11, Chap. 12.

England, where he was appointed to prepare a similar expedition, but this was a failure through the cowardice of Sir Thomas Pert. Robert Thorne, a celebrated Bristol merchant, urged Henry VIII. to prosecute such voyages to the world of "gold, balmes and spices." The dreadful sweating sickness of 1517, however, spread death and dismay throughout the kingdom.

In 1520 Cabot returned to Spain with Charles V. and was appointed "Pilot master to the Spanish monarchy." In 1524 Spain and Portugal quarrelled about the limits assigned by the Papal Bull, and held a conference. At the head of the list stands "Sebastian Cabot" and "Ferdinand Columbus," when it was decided in favour of Spain. In 1525 Cabot was appointed chief of an association formed at Seville to prosecute trade with the East, with Robert Thorne of Bristol. In 1526 Cabot left with an expedition for the East *viâ* the Straits of Magellan, but owing to a mutiny he put into La Plata and explored the river as well as the Parana, but he was attacked near the present site of Buenos Ayres. Charles sent a fresh expedition to his aid, and in 1531 Cabot returned to Spain as "Pilot Major." Henry VIII. died in 1546, and in 1549 Cabot returned to Bristol an old man, under King Edward VI., who patronised him liberally. Charles V. tried in vain to induce him to return to Spain. He was employed in investigating the variation of the compass, and is said to have published a map of the world, and a work entitled '*Navigazione nelle parte Septentrionale.*' He was also engaged on other means for improving navigation, and was frequently consulted on all such matters. He advised a new expedition of three ships to go by the northern route; and notwithstanding the opposition of the "steel yard" (Germans), who had a monopoly, the "Merchant Adventurers' Company" was formed,¹ with Cabot as governor, and an expedition was despatched in 1553 under Sir R. Willoughby and R. Chancellor. Cabot drew up their celebrated instructions in thirty-two articles. They reflect the highest credit on his sagacity, good sense, and comprehensive knowledge, and they are full of admirable advice and soundest principles. Beyond special and minute instructions as to navigation, the most rigid attention is enjoined to the moral and religious duties of the crews.

'No blasphemy of God, or swearing, ribaldrie, filthy tales or ungodly talke; neither dicing, carding, tabling, nor other devilish games, whereby ensueth povertie, strife, variance, brawling, fighting and oftentimes murther, to the utter destruction of the parties, and provoking of God's most just wrathe and

¹ This Society still exists in Bristol.

sword of vengeance. These and all such like pestilences and contagions of vices and sinnes to be eschewed, and the offenders once monished and not reforming, to be punished at the discretion of the Captain. It is likewise ordered that morning and evening prayer to be reade and said in every ship daily . . . and the Bible or paraphrases to be reade devoutly and Christianly to God's honour, and for his grace to be obtained, and had by humble and heartie prayer of the navigantes accordingly."

The expedition met with many disasters, and both commanders perished, but in 1557 it returned with a Russian ambassador who met with a very hearty reception.

Queen Mary left all such matters to her husband Philip, and the miserable wretch reduced Cabot's pension one-half, and shortened his life. From this time Cabot sank into comparative insignificance. Sixty-one years had elapsed since the date of his first commission, and the powers of nature failed. Mr. Nicholls says :—¹

"His last public appearance recorded was, his dining on board the pinnace *Seathrift*, Captain Burroughs, at Gravesend, April 17, 1556, but he is known to have been alive April 27, 1557, when Philip compelled him to resign his pension. It further appears that Eden (see his 'Taisnerus' in the British Museum) was present at his death ; but he has not noted either the place or date thereof."

He must, however, have been eighty years of age.

What a contrast does his career present to that of the early Portuguese and Spanish navigators, whose lives were marked by cruelty, rapine, and murder ! Vasco de Gama cut off the hands, ears, noses and lips, not only of his captives, but of a Brahmin priest, who was sent by the king as an ambassador, to sue for peace under a safe conduct from De Gama, and another he roasted over a slow fire. Cortez is estimated to have killed 100,000 Mexicans on his invasion, and he committed the most horrible cruelties. Pizarro treacherously strangled and burnt Athualpa, whose part he had professed to take, and afterwards strangled his fellow-countryman and companion Almagro. The Portuguese, too, have always been noted for their barbarous cruelty to the African negroes. Columbus was also a marked contrast to these sanguinary wretches ; a man of the highest character and noblest purposes, but he was manacled and imprisoned by a Spanish rival. Sebastian Cabot may be justly regarded as one of the most illustrious navigators the world has ever seen, and though history

¹ 'Life of Cabot,' p. 186. Nicholls was librarian of Bristol library.

has failed to do him justice, England owes him a debt of imperishable gratitude. One of his biographers writes :—

“He ended, as he had begun, his career in the service of his native country ; infusing into her marine a spirit of lofty enterprise, a high moral tone, and a system of inflexible discipline, of which the results were not long after so conspicuously displayed.”

Lord Campbell says of Cabot :—

“He was the author of our maritime strength, and opened the way to those improvements which have rendered us so great, so eminent and so flourishing.”¹

Mr. W. S. Lindsay says of him :—

“The exact date of his death is not known, nor has any record been left where he was buried. He, who with Columbus, had presented a new world to his sovereign, died like him, neglected, if not despised ; and at last so thoroughly unknown, that England cannot point to the spot of earth where rests all that was mortal of one of her best and bravest seamen.”²

The old city of Bristol is but little altered since the days of Cabot. The street in which he lived, and the quays from which he embarked may still be seen by the visitor, and the lovely, tortuous little Avon down which he sailed on his memorable voyages, still winds its way to “Kingroad” and the Bristol Channel. New trades have been created ; ships from America, India, and all parts of the world now crowd those quays, but the citizens still revere the name, and cherish the memory of Sebastian Cabot.

¹ ‘Lives of the Admirals.’

² ‘History of Merchant Shipping,’ vol. ii., p. 86.

CHAPTER II.

EARLY SAILING SHIPS.

ALTHOUGH the Portuguese were the first to discover the route to India, *via* the Cape of Good Hope, and were skilled sailors, they made very poor colonists. They were ignorant, superstitious, and cruel. They discovered Brazil in A.D. 1500, as also parts of Africa. They colonised both, but they were the chief actors in the barbarous slave trade, with all its indescribable horrors, and inflicted on the beautiful province of Brazil two curses, from which it has suffered to this day—African negroes and yellow fever. In A.D. 1580, Portugal was conquered by Spain. Her colonies were neglected, and many were wrested from her by Holland and other powers. In 1640 she regained her independence, but she has dwindled into insignificance, with a small merchant fleet, a contemptible navy, and disordered finances. Holland seized her Indian possessions, and Brazil ultimately became independent. Her rival, Spain, however, became a very powerful state in the 15th and 16th centuries. She had large possessions in South America, the West Indies, the Netherlands, Italy, Africa, and the Indian archipelago. In the middle of the 16th century her troops were the first in Europe; her fleets covered the seas. The mines of Potosi and Chili enriched Cadiz with an annual tribute equal to 100,000,000 dollars. In 1554 King Philip II. was considered a fit consort for a queen of England, and married her. But the Spaniards were proud, haughty, avaricious, intolerant, and cruel. In conquering St. Domingo they are said to have destroyed, in battle or cold blood, three million of its inhabitants, including women and children. By the persecution and expulsion of the Jews and the Moors they lost much of their commerce and manufactures. Philip II. established the inquisition in the Netherlands, and persecuted the Protestants to such an extent that 100,000 of them are said to have perished at the hands of the barbarous Duke of Alva. In 1588 she invaded England with her

great armada, which was repulsed and nearly destroyed. In 1648 she was compelled to recognise the independence of the seven United Provinces, and soon afterwards lost her Italian possessions. In 1704 Gibraltar was captured by England, and afterwards Trinidad. In 1805 Nelson at Trafalgar destroyed her naval power. Louisiana was ceded to France and Florida to the United States, while Peru, Chili, and the Central American states gained their independence. Thus Spain was reduced to a fifth-rate power.

Following Portugal and Spain, Holland came to the front as a great maritime power. The Dutch were made of very different stuff to either the Portuguese or the Spaniards. Lovers of freedom, they not only fought desperately against their cruel persecutors, the Spaniards, but they embraced the reformed religion, and gave hospitable shelter to the persecuted of England and other countries. Bold, energetic, and brave, they carried everything before them. In 1585, having obtained the help of England, they baffled all the efforts of Spain; and their commerce arrived at such a height, that in 1602 they established their celebrated East India Company. Spain, being both weakened and discouraged by the ill success of a tedious war, in 1609 agreed to an armistice for twelve years. During this truce the Republic attained to a degree of power which it has never since exceeded.¹ Compelled by necessity to make war against the Spanish fleets, the Dutch soon became excellent sailors, and enterprising, indefatigable merchants, who visited every sea, and to whom no port was too distant, no obstacle too discouraging. The commerce of Cadiz, Lisbon, and Antwerp fell into their hands, and in this way the United Netherlands, in the middle of the 17th century, was the first commercial state and the first maritime power in the world. With one hundred vessels of war they bade defiance to every rival. The Dutch East India Company conquered islands and kingdoms in Asia, and with about two hundred ships they carried on a trade with China and Japan. They alone supplied Europe with the productions of the Spice Islands. The gold, the pearls, the precious jewels of the East all passed through their hands. They owned the great island of Java, and in 1610 built the city of Batavia. In 1624 they founded New Amsterdam, now New York. They possessed colonies in the West Indies and in South Africa. They supplied the ships which carried on the foreign commerce of England, and after repeated wars, in 1648, by the treaty of Munster, Spain renounced all claim to the United Netherlands.

¹ See Motley's 'Rise of the Dutch Republic.'

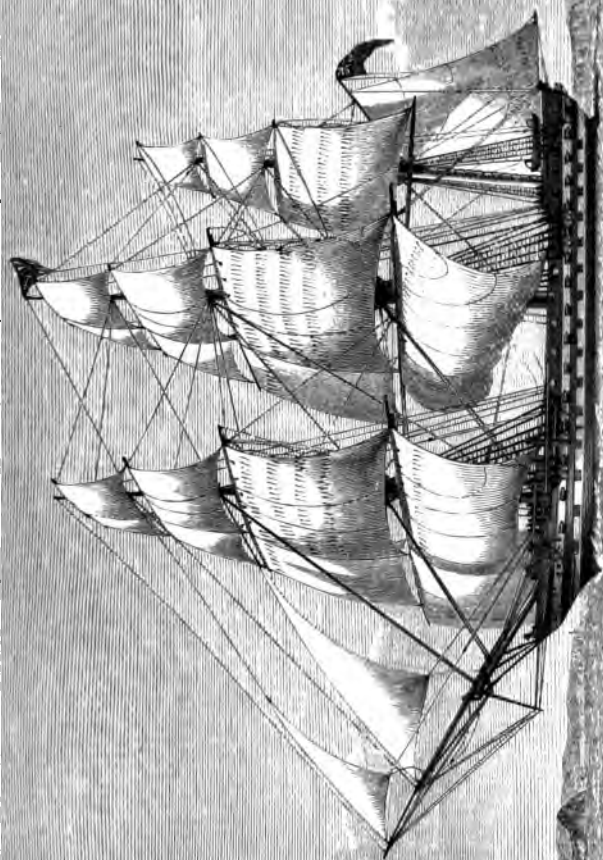
But now a great man arose in England, whose bold measures turned the tide, and did much to destroy the maritime power of the Dutch. Oliver Cromwell determined to wrest the supremacy of the sea from Holland and to encourage British shipping. This he did by means of his celebrated Navigation Laws, passed in 1651. They enacted that—

"No goods or commodities whatever of the growth, production, or manufacture of Asia, Africa, or America should be imported into either England or Ireland, or any of the plantations, except in British-built ships, owned by British subjects, of which the master and three-fourths of the crew belonged to that country." A subsequent Act enacted that no goods of the growth, production, or manufacture of Europe should be imported into Great Britain except in British ships and navigated by British subjects, *or in such ships as were the real property of the country, or place in which the goods were produced, or from which they could only be, or most usually were, exported.*

From these Acts, which were only repealed in 1849, may be dated the decline of the maritime supremacy of the Dutch and the rise of the British.

The Dutch, seeing that these stringent laws could only be aimed at them, at first sought to effect a treaty with England, but secretly determined to fight for their supremacy at sea. They got together one hundred and fifty vessels, and placing Martin Van Tromp in command, declared war in 1652. Desperate and sanguinary struggles ensued, with varying fortunes to both sides. Blake was the great English admiral, assisted by Monk, Ayscough, Prince Rupert, Spragge, and the Earl of Sandwich. The Dutch had Martin Van Tromp and his son Cornelis, De Ruyter, De Witt, Van Ness and others. Six great actions were fought in 1652-3 on the English coasts. The English won three, the Dutch two, and one was indecisive. The Dutch suffered severely, not only in the loss of warships, but by the capture of their fleets of merchantmen, and the diminution of their trade. So, on the 5th April, 1654, a treaty of peace was concluded, but Cromwell refused to abate one jot of the new laws, and he demanded, and received, an admission of the English sovereignty of the seas. Cromwell died in 1658, and his laws were ignored, but Charles II. was compelled to re-enact, and virtually to confirm, Cromwell's Navigation Acts in the first year of his reign.

The Dutch, fearing their maritime downfall, and urged on by the intrigues of France, in 1664 were ripe for a fresh war, but endeavoured to gain time. Charles, however, seized 130 of their ships, homeward bound, before the formal declaration of war, and they were condemned as lawful prizes. War was consequently



CLIPPER SHIP "THE GREAT EASTERN" SAILING FOR THE EAST

again declared, and a great battle was fought off Harwich, 3rd June, 1665. The Dutch lost 19 ships and 6000 men; the English 4 and about 1500 men. In 1666 France declared war against England, and Denmark was subsidised to assist the allies with a fleet. In June, 1666, a bloody struggle took place off the coast of Flanders, when the English lost 2 admirals, 23 great ships, 6000 men, and 2600 prisoners; and the Dutch lost 4 admirals, 6 ships, and 2880 men. Another great battle was fought on the 24th July, when the English beat De Ruyter, driving him into port, and afterwards burning 100 merchant ships. Negotiations were opened for peace at Breda, but the Dutch, believing Charles to be trifling, despatched De Ruyter to the Thames. He destroyed the fortifications of Sheerness, burnt three ships, and then burnt three more near Chatham. The Londoners were greatly alarmed, and sunk seventeen ships at Woolwich and Blackwall, fearing he would sail up to London Bridge. De Ruyter retired, but scoured the English coast until the treaty of Breda was signed in July, 1667. Thus terminated this bitter and bloody struggle. England suffered much, but Holland still more, and her trade was permanently crippled, while England's steadily increased, and London succeeded Amsterdam as the chief emporium of the commercial world.

To go back, in 1591, Thomas Cavendish, an Englishman, undertook a voyage to the East Indies, which led to the formation of the great East India Company, in 1600, by London merchants, assisted by Robert Thorne, of Bristol, the largest and most important commercial undertaking recorded in history. This great company lasted two hundred and fifty-eight years. It commenced with five vessels, 130 to 600 tons, and gradually increased their size to 1507 tons. The company had a monopoly of English trade with India and China, and made vast sums, but their expenditure was on a lavish scale. They ultimately conquered and held a large part of India. At one time they had a footing in Japan too. They had many conflicts with the Dutch and Portuguese, and in the next century were harassed by French ships of war and privateers, and had to arm and increase the size of their ships in order to fight successfully. Between 1700 and 1819 forty-four of the company's ships were captured by the enemy, although they were often victorious. They charged enormous freights, as much as £30 per ton measurement for tea, and their captains made large fortunes. They were the first to build large English merchant-ships. In 1858 the company was finally dissolved, and their territories transferred to the Crown, the trade to India having been thrown open in 1814, and in 1832 the China trade followed.

Up to 1651, as we have seen, English maritime commerce was pretty well monopolised by the Dutch, the English being busily engaged in domestic troubles and fighting for political freedom.

A well-known writer of about 1666, Sir Henry Petty, estimated the tonnage of all Europe at 2,000,000 tons, of which he apportioned 900,000 tons to the Dutch, 500,000 to the English, 100,000 to the French, 250,000 to the Hamburgers, Swedes, and Danes, and 250,000 to Spain, Portugal, and Italy. But between 1666 and 1688 Dr. Charles Davenport says that the British tonnage had doubled. Such had been the effect of Cromwell's Navigation Laws. France, her old enemy, sought to maintain supremacy over both the Dutch and the English, and by means of her navy and privateers, played havoc with British ships, but on May 12th, 1692, Admiral Russell defeated the French in the great battle of La Hogue; and the treaty of Ryswick, in 1697, led to great prosperity. During these years, however, England was gradually increasing her colonial possessions, and thus extending her empire. The Pilgrim Fathers landed in New England, November 9th, 1620, and laid the foundations of a great nation. Jamaica, Barbadoes, and other West India islands, the Bermudas, the Bahamas, Nova Scotia, the Gambia, the Gold Coast Settlements, and St. Helena, were all conquered or settled in the 17th century.

The English revolution occurred in 1688, and from that time the trade of the plantations, or colonies, steadily and rapidly increased.

British ships, however, were still very small. In 1701-2 a return shows the number of ships owned in the principal ports was as follows :—

	Number of Ships.	Average Size.	
		Tons.	Tons.
London	560	84,882	157
Bristol	165	17,338	105
Yarmouth	143	9,914	69
Exeter	121	7,107	58
Hull	115	7,564	65
Whitby	110	8,292	75
Liverpool	102	8,619	84
Scarborough . . .	102	6,860	67

The Dutch Indiamen were evidently copied from the Genoese carracks, and the early English ships were built on much the same model, with high poops and forecastles. Cabot's ship was only 200 tons; Drake went round the world in the *Pelican*, of 100 tons, and four smaller vessels; Frobisher started for China

viâ the north-west, in 1576, with the *Gabriel* and *Michael*, of only 25 tons, and discovered Greenland. Within the memory of the writer (1838-50) ships of 300 tons traded to India and China, and barques of 200-300 tons to the West Indies, while the trade of Quebec was carried on chiefly by brigs of 150 to 300 tons. Now Great Britain owns many iron sailing-ships of 2000 to 3000 tons, and one four-masted ship of 3336 tons.

To return, we must pass rapidly over the 18th century, the great modern development of British shipping not having commenced till the 19th.

Scotland was united to England in 1707, which gave an immense impulse to the commerce of the former. War often caused serious losses to British shipping, and during the reign of George I. (1714-27) hordes of privateers and buccaneers infested the seas whenever war was declared, plundering legitimate commerce. Many new colonies were added, and the century was remarkable for English maritime expeditions, which added to the geographical knowledge of mankind, and promoted the peaceful arts of commerce. Among these were those commanded by Dampier in 1699; Anson in 1740; Byron in 1764; Wallis, and Carteret, and Cook. Gibraltar was captured in 1704; Canada in 1759-60; Honduras in 1783; and the Straits Settlements in 1785; New South Wales was colonised with convicts in 1787; and Sierra Leone in the same year.

But now another great maritime power came into existence. The American colonies demanded, and at length obtained, severance from the Mother Country. In 1776 they signed the "Declaration of Independence," and after coercive measures had failed, it was finally acknowledged on the 30th November, 1782, but the treaty was only signed on 3rd March, 1783, and ratified by Congress 4th January, 1784. Though they could not interfere with the foreign or coasting trade of Great Britain, except to and from their own ports, they rapidly produced some of the finest sailing-ships in the world. They were singularly favoured by Nature for maritime affairs. They had great forests of oak and pitch pine, both eminently suitable for shipbuilding. New York and New England possessed numerous deep-water harbours, and the latter had a large, hardy, seafaring population. The early New York packet-ships were splendid specimens of naval architecture, 800 to 1800 tons, and most of them with three decks. They almost monopolised the trade between England and the United States for many years; they often made rapid passages in the spring and summer, but in winter they had to contend with such heavy

westerly gales that they sometimes occupied sixty, seventy, eighty, and even ninety days to reach New York. Many of them carried one thousand emigrants, but after a long and bitter struggle with iron screw steamships they finally disappeared in 1860.

In 1793 commenced the terrible struggle with Napoleon, lasting with short intervals until 1815, paralysing British trade, and involving Great Britain in an enormous debt, heavy taxation, suspension of specie payments, and a commercial panic; at the close of this war the debt stood at £900,000,000, or \$4,500,000,000! Then the war with the United States lasted from 1812 to 1817.

In 1849 the discovery of gold in California led to a great demand for extreme clipper ships, and the United States turned out the largest and the finest wooden sailing ships afloat. In 1851 a similar discovery in Australia led to great activity among British and Colonial shipbuilders. Quebec, St. John, N.B., and Nova Scotia, all turned out large wooden clippers up to 1800 tons. During the war with Napoleon, too, Ceylon, Trinidad, Malta, British Guiana, Cape Colony, Mauritius, and Ascension were added to the British Colonial Empire.

The repeal of Cromwell's Navigation Laws in 1849 gave the Americans access to the whole foreign and colonial trade of Great Britain, and they became severe competitors with the British, so that at one time, in 1861, they owned (including river and lake tonnage) slightly more tonnage than Great Britain and Ireland, say 5,400,000 tons. But during the terrible Civil War a few privateers fitted out by Southerners, chief of which was the celebrated *Alabama*, so crippled American commerce by burning Northern ships at sea, that United States shipowners rapidly transferred their tonnage to neutral flags or sold them.

But all this while two revolutions were quietly going on, both of which greatly favoured Great Britain above every other nation, and ultimately placed her in her present proud position. Iron and steam were the agents. Steam tonnage replaced sailing vessels, and iron and steel wooden hulls, and to the history of these two great revolutions we must now turn.

CHAPTER III.

HISTORY OF THE MARINE STEAM ENGINE.

EMINENT naturalists, such as Owen, Darwin, and Paley, have often pointed out that many of the inventions of man are but feeble imitations of the wonderful works of Nature. This is true as regards the steamship. The tail of the fish embodies the principle of the oar and the screw propeller, and it has long been a proverb among sailors that "a cod's head and a mackerel's tail" form the best possible design for a fast-sailing ship. The web foot of the duck was the prototype of the paddle wheel. The cuttlefish is propelled by ejecting a fluid from a tube, exactly as is H.M.S. *Waterwitch*, or Dr. Jackson's *Evolution*.¹ The swan extends her wings as sails to catch a favouring breeze. The combined action of the paddle wheel and screw propeller will be found in the microscopic insects *Paramacium caudatum* and *Paramacium compressum*, and even the bulkheads of the modern iron steamship have their exact counterpart in the shell of the little nautilus, while the spider's web is composed of four thousand strands, and is fifty per cent. stronger in proportion than our steel wire rope.

The idea generally entertained that the power of steam is a modern discovery has been proved to be erroneous, for it was known 120 B.C., when Hero of Alexandria experimented with it and published an account of his "Æolipile" in his treatise on pneumatics.

Mr. Bourne states that the principle of the "Æolipile" is the same as that embodied in Avery and Ruthven's engines for the production of rotary power.

The works of Woodcroft show that as early as the 13th century Roger Bacon spoke "of a vessel which, being almost wholly submerged, would run through the water against waves and winds with a speed greater than that attained by the fastest London pinnaces." In 1601 Baptista Porta, of Naples, published many

¹ Darwin.

curious experiments on the power of steam and its condensation. In 1615 Solomon de Caus shows that he was well acquainted with the power of steam. In 1618 David Ramsay obtained a patent for an invention "to make boates for carriages running upon the water as swift in calmes and more safe in stormes than boates full sayled in great windes," and in 1630 he patented a plan "to make boates, ships, and barges to goe against the wind and tide."¹

In 1637 Francis Lin patented a similar plan, and in 1646 Edward Ford proposed another. In 1661 the Marquis of Worcester, a wonderful man, was certainly the first to make an actual steam engine : he refers to "a boat that roweth or letteth even against wind and stream," and he speaks of "water rarefied by fire." In the same year, Hooke described windmills, in which we have all the main features both of the screw propeller and feathering wheel.² Papin, who was driven from France by the revocation of the Edict of Nantes, and elected F.R.S. in 1681, describes in 1690, "a steam cylinder in which a piston descends by atmospheric pressure, when the steam below it is condensed," and as one of its uses he mentions, "the propulsion of ships by rames and volatiles," or paddle wheels.³ He certainly first suggested the vacuum.

Thomas Savery, one of the most ingenious men of his age, proposed in 1696, a mode of raising water by "the impelling force of fire," adding, "it may be very useful to ships."⁴

Thomas Newcomen, a working blacksmith of Dartmouth (Devon), greatly improved Savery's engine in 1705, and Papin used it to propel a steamboat on the Fulda.

Jonathan Hulls, of Campden (Gloucestershire), in 1736 made some practical progress, and secured a patent for propelling a steamboat by a steam engine driving a *stern wheel*,⁵ which was the first steamboat authentically recorded ; although his boat was hardly fitted for the purposes of commerce, many such have since been used in the United States and Australia.

But it was not until the 5th January, 1769, when James Watt, a native of Greenock, obtained his patent, that any steam engine could be effectually adopted in marine propulsion. Watt was a mathematical instrument maker, and his first connection with the steam engine arose from his having been requested by the Professors of Natural Philosophy in the University of Glasgow to

¹ Woodcroft.

² Bourne.

³ Woodcroft, pp. 16, 17.

⁴ 'The Miners' Friend.'

⁵ Woodcroft.

repair a model of one of Newcomen's engines in 1764. Among his various improvements in the steam engine, the most important were the separate condenser, and the double-acting engine for causing the steam to act above the piston as well as below it. These rendered the power of the engine much more effective, and caused considerable economy. He also invented the crank, and in 1781 the "sun and planet motion"; this did not answer, but his partner, James Pickard, in 1780 patented a method of working a mill with a rotary motion by means of the present connecting rod, crank and flywheel, constituting the second important improvement in the steam engine. There seems little doubt, however, that Watt was the real inventor of the crank, but neglected to take out a patent.¹ Joseph Bramah, a man of genius, in 1785 obtained a patent and proposed to propel vessels through the medium of either a paddle wheel or a screw propeller, but there is no record of his having put it into practice. Patrick Miller, of Dalswinton, Scotland, in 1787 published a pamphlet on the subject of propelling boats by means of paddle wheels turned by men, and spent some £30,000 in experiments. A tutor in his family, Mr. James Taylor, urged Mr. Miller to apply steam to drive the wheels of his boat, and at last he was induced to employ a young, hardworking operative engineer, William Symington, who soon produced the desired results. The engine was placed in a small pleasure boat only twenty-five feet long, and tested on Loch Dalswinton, 14th November, 1788. Although the cylinders were only four inches in diameter, it drove the boat at the rate of five miles an hour. After a few days it was taken out, and is now in the Patent Office Museum, London. In 1789 it was resolved to repeat the experiment on a larger scale on the Forth and Clyde Canal. A double engine, with 18-inch cylinders, was built at the Carron Ironworks, fitted on board another of Miller's vessels, and tried on Dalswinton Loch in December, 1789, with great success, making 6½ to 7 miles an hour. More than ten years elapsed before Symington found another patron. In 1801 Lord Dundas employed him to fit up a steamboat to tow barges on the Forth and Clyde Canal, and called her the *Charlotte Dundas*, after his daughter. Having availed himself of Watt's improvements, Symington patented his new engine 14th March, 1801, and in the opinion of most impartial writers, she was *the first practical steamboat*.² In March, 1802,

¹ Muirhead's 'Life of Watt.'

² John Fitch, the son of a Connecticut farmer, who was born in 1743, was a genius and a prophet. He was engaged at the same time as Symington in experimenting on steamboats; but he was far less of a practical engineer than

she went on her trial trip and was most successful. Her cylinders were 22 inches with 4 feet stroke. The Duke of Bridgewater gave him an order to construct eight similar vessels, but the Duke died before the details of the agreement were completed. The *Charlotte Dundas* was laid up out of fear that she would injure the banks of the canal.

Poor Symington, being in great poverty, at length received £150 from the Privy Purse, and now, in the year 1891, a bust of him has at length been placed in the Edinburgh Museum of Science and Art!

Mr. Woodcroft says: "Symington had the undoubted merit of having combined for the first time *those improvements which constitute the present system of steam navigation.*" It is a singular fact that Watt discouraged Symington, predicting the failure of his engine, and threatening him with legal penalties if it succeeded.

In 1800 Henry Bell, of Helensburgh, opposite Greenock, laid before the Government his invention for the improvement of steam navigation, but it was not until January, 1812, that he completed the *Comet*. She was the first *passenger* steamboat built in Europe; 40 feet keel, 10½ feet beam, and only 4 H.P. She was built for Bell by John Wood & Co., of Port Glasgow, and ran between Glasgow, Greenock, and Helensburgh three times a week.

Two claims have been made by Americans for priority. John C. Stevens spent thirteen years (1791-1804) and \$20,000 in experiments, and in 1804 tried small twin-screw propellers near New York; but he admitted that, on the whole, his attempts were unsuccessful.

Robert Fulton, also an American, a very ingenious and enterprising civil engineer, built the *Clermont* and ran her on the

the young Scotch mechanic. He first proposed to use vertical oars, worked by cranks, turned by a horizontal steam engine. In 1786 he tried his machine at Shepherdstown, Pennsylvania, in a boat of nine tons. In 1787 he built another boat, 45 × 12 feet, with a 12-inch cylinder, the mode of propulsion being somewhat similar, in which he is reported to have made the trip from Philadelphia to Burlington, at an average rate of seven miles an hour.

In 1790 he completed another and a larger boat, propelled in a different manner. But the grasshopper paddles, which he now employed, were not adapted for the general purposes of navigation. It is evident that his plans were either not adapted for practical purposes, or that the machinery was too complicated, or too expensive. He once wrote: "This, Sir, whether I bring it to perfection or not, will be the mode of crossing the Atlantic in time for packets and armed vessels." A remarkable prophecy. But all his plans failed; he was generally deemed to be crazy, and died in 1798.

Hudson River in 1807 with 24-inch cylinders, and 4-foot stroke (Symington's was 22 in. by 4 feet), but it is now well known that in 1802 he called on Symington, saw the latter's engine in motion, and was allowed to take notes and sketches of it, under a promise that Symington should have the superintendence of building such vessels in the United States. But he never afterwards communicated direct with Symington.

Moreover, Bell had forwarded to the U.S. Government in 1803, a detailed account of his method of propelling vessels, and it seems that Fulton had been given or shown the plans. By a letter addressed by Bell to the *Caledonian Mercury* in 1816, it appears that Fulton wrote him (probably in 1803), requesting him to call on Mr. Miller and Mr. Symington, and to send him a drawing and description of the last boat, with the machinery. These were sent out, and sometime afterward Fulton answered that he had "constructed a steamer from the different drawings of the machinery forwarded to him by Bell which was likely to succeed with some necessary improvements." It has also been stated that the *Clermont's* engine was built by Boulton and Watt, of Birmingham, England.

The *Comet* did not pay, and she was sent to ply on the Firth of Forth, where she usually ran 27 miles in 3½ hours (7½ miles an hour). Her engine is now in the Kensington Museum, London. Bell failed to profit by his undertaking, and died at Helensburgh in 1830, aged 63, having been chiefly supported in his declining years by an annuity of £50 a year, granted him by the Clyde trustees.¹ No merit therefore as the *inventor* of the present system of steam navigation can be conceded to either Fulton or Bell. In fact there can be no doubt that Symington's *Charlotte Dundas* was superior in mechanical arrangements to either the *Comet* or the *Clermont*; but both were instrumental in the introduction, for commercial purposes, of steam navigation. It is only just to Fulton to remark that he never claimed to be the *inventor* of the steam engine as applicable to marine propulsion; Mr. Lindsay too says that he never took out a patent for his engine, but another writer affirms that he did, and gives the date as February, 1809.

The success of the *Comet* and *Clermont* soon led to many others. In 1813 Leeds, Manchester, and Bristol built one each, and in 1814 Hull built another. In December, 1814, the first steamboat was seen on the Thames, the *Margery*, 70 tons, 14 H.P. In 1815 the first arrived at Liverpool from the Clyde. In 1818 David

¹ James Deas, C.E. In 1889 the Clyde alone turned out 250 ships, of 335,201 tons, of which 253,374 tons were iron or steel steamships!

Napier, a name more associated than any other in Great Britain with the early development of the steam engine, launched the first sea-going steamboat from the yard of William Denny, of Dumbarton, the *Rob Roy*; she was only 90 tons and 30 H.P., but she ran between Glasgow and Belfast with great success.

In 1826 the first of the so-called leviathans, the *United Kingdom*, was built by Robert Steele, of Greenock, to run between London and Leith. She was 160 feet long, 26½ feet beam, 200 H.P., and was considered the wonder of the day. She was no doubt the prototype of the *Royal William*, laid down at Quebec four years later, and launched in April, 1831.

CHAPTER IV.

THE STEAMBOAT IN CANADA.

CANADA, and especially Montreal, was closely identified with the introduction of steam navigation. It is remarkable, but perfectly true, that a steamboat carrying passengers ran between Montreal and Quebec in 1809, *three years before* any such vessel ran in Great Britain. This was the *Accommodation*, 75 feet keel, and 85 feet on deck, and was doubtless copied from Fulton's *Clermont*. On her first trip she occupied sixty-six hours, thirty of which she was at anchor.¹ She was due to the enterprise of the late John Molson.

In 1813, she was followed by a larger boat, the *Swiftsure*, 130 feet keel, and 140 feet on deck, with a beam of 24 feet, which made the downward trip in 22½ hours.² In the same year the *Car of Commerce* was built, followed, in 1817, by the *Quebec* of 100 tons, and 100 I.H.P., the engines for which were supplied by Messrs. Maudslay & Sons, of London, England; and also the *Lanzon*, a ferry steamboat, 150 tons, and 50 H.P.

In 1833, Quebec sent forth the first Atlantic steamship, the *Royal William*, which steamed from Quebec to London (*via* Pictou) in 25 days, four years before any other ship succeeded in doing it.

¹ *Quebec Mercury*, 1809. Mr. William McLennan writes, that she left Montreal, November 3, 1809, and made the run in thirty-six hours. The fare was £2 10s. = \$12.

² *Quebec Mercury*.

CHAPTER V.

EPOCHS IN ATLANTIC STEAM NAVIGATION.

THE history of Atlantic steam navigation is, in truth, only an illustration of the progress of the human mind. At the beginning of this century there was not a single trading steamship in existence. The *Comet* of 1812 has multiplied into 12,000 steamships, measuring over 16 million tons, of which about 63 per cent. belong to the United Kingdom, trading to every corner of the world. Her 20 tons have multiplied into a ship of 18,000; her 40 feet to 692 feet; and her 4 H.P.¹ to 30,000 in a single ship. Symington's 4-inch cylinder has grown to 120 inches; the pressure of steam in the boiler has increased from 13 lbs. to 200 lbs. on the square inch; the 243 knots, the maximum of the *Great Western* in 1838 to 560; and the average speed from 8·2 to 22·01 knots, while the consumption of coal has decreased from about 5½ lbs. to 1½ lbs. per I.H.P. per hour, and is continually diminishing. There have been at least six distinct epochs in Atlantic steam navigation during these years.

- 1st. Sail to wooden paddle (for speed), 1833.
- 2nd. Wood to iron hulls (for strength), 1843.
- 3rd. Paddle to screw (for economy), 1850.
- 4th. Simple to compound engines (to save fuel), 1856.
- 5th. Iron to steel hulls (for cost), 1879.
- 6th. Single to twin screws (for safety), 1889.

These epochs it is proposed to consider in the order given above.

¹ H.P. means *nominal* horse-power, an arbitrary rule of the British Admiralty, depending on the diameter of the cylinders, and the length of the stroke. I.H.P. means the *actual* power exerted by the engines, as shown by an indicator.

FIRST EPOCH.

Some dispute has arisen as to the first North Atlantic steamship, but there is no difficulty now in giving the exact truth. As, however, numerous errors and contradictions have occurred, and been perpetuated, as to these early steamships, it seems desirable to correct them and place the facts beyond doubt. Even so high an authority as the Canadian Government statistician, Mr. George Johnson, tells us that the *Great Britain* was built at London, (England), whereas the writer saw her building at Bristol. Mr. McCord contradicts Mr. Miles's prize essay as to the *Royal William*, and both are now proved to be wrong, as we shall see. A recent article in 'Scribner's Magazine' also contains several errors.

The claim of the *Savannah* may be dismissed in a few words. She never was a "steamship" in the ordinary meaning of the term, and on the only occasion on which she attempted to steam across the Atlantic, she failed to accomplish it. Some say she tried it in 1818, and some say it was in 1819. Some give her port of departure as Savannah, and some say she sailed from New York. A recent writer¹ has cleared up these points satisfactorily. She was a small sailing ship of 350 tons, built at New York, for a sailing packet between New York and Havre. When building, she attracted the attention of Captain Moses Rogers, who had been associated with Fulton and Stevens in commanding the *Clermont* and several other early steamboats on inland waters; on his advice, she was purchased by Messrs. Scarborough & Isaacs of Savannah, Georgia. She was rigged as a ship, steam apparently being intended as an auxiliary in calms or light head winds. Her engine was built by Stephen Vail, afterwards associated with Morse in the invention of the telegraph, at the Speedwell Ironworks, near Morristown, New Jersey. It had only one cylinder of 40 inches diameter with 6 feet stroke. Her paddle wheels were of wrought iron, and comprised 8 radial arms, held in place by one flange, and so constructed as to enable them to be closed together like a fan. *They were furnished with a series of joints, so that they could be detached speedily from the shaft and taken on deck*, which could be done in twenty minutes. She left New York on March 29th, 1819, for Savannah, where she arrived on April 6th, as duly recorded in the *Savannah Republican* of the 7th. In the same paper, we have the following advertise-

¹ 'Our Ocean Railways,' by A. Fraser-Macdonald, pp. 37, 46.

ment on the 19th May: "The steamship *Savannah*, Captain Rogers, will, without fail, proceed for Liverpool direct to-morrow, 20th inst," but she only actually sailed on the 22nd. She was spoken with on the 29th, in lat. 27.30° N., which settles her port of departure. Her log shows that she was off Cork on the 17th June, when there was "no cole to git up steam," but "with all sails set to the best advantage," she appears to have arrived in the Mersey at 6 P.M. on the 20th, "making the run in 29 days 11 hours from Savannah to Liverpool, during which the engine worked the wheels only 80 hours."¹ This affords ample proof of what has been stated. On the 21st July, she sailed for St. Petersburg, *via* Stockholm, where she arrived on 13th September, steam being used for only 239 hours. On the 10th October she sailed for Savannah. The engines were not used on any single occasion during it until November 30th, when, as the log informs us, Captain Rogers "took a pilot *inside the bar*, and at 10 A.M. anchored in Savannah river and furl'd sails—got under weigh with steam and went up and anchored off the town."

So that as an Atlantic steamship she was a complete failure. In 1820 she was sold, her engines taken out, and she was employed as a sailing packet between Savannah and New York, and subsequently lost on Long Island.

The honour undoubtedly belongs to Quebec, and all the facts relating to the ship have recently been given by her builder, and the true dates ascertained from the diary of the Quebec Exchange (both unimpeachable authorities).

Mr. W. S. Lindsay, ex-M.P., in his admirable 'History of Merchant Shipping,' says, in a note, "The *Royal William* was between 400 and 500 tons, built at Three Rivers, and her engines, constructed in England, were fitted into her at St. Mary's Foundry, Montreal. She only made this one Atlantic passage, and was sold to the Portuguese Government."

Here are three historical errors in half-a-dozen lines, and they have been very widely copied.

Mr. James Goudie, who brought out her plans from Greenock, and acted as foreman, has recently given the facts in a published letter to Mr. Archibald Campbell, of Quebec.

She was 830 tons. She was built at Cap Blanc, Quebec, near the toll-gate, by George Black and John Saxton Campbell for a Quebec company, to run between Quebec and Halifax, N.S. Her engines were put in by Bennett & Henderson, of Montreal, and

¹ Captain Rogers, written to a Connecticut paper in 1838.

she was sold in London to the Spanish Government as a warship or transport. Her dimensions were 146 feet keel, 176 feet over all ; beam, 27 feet 4 inches, and 43 feet 10 inches outside the paddle boxes ; depth, 17 feet 9 inches, very nearly the same dimensions as the *United Kingdom*.

The diary of the Quebec Exchange, as published in the *Montreal Gazette*, shows that she was launched on Friday, April 29th, 1831, in the presence of His Excellency Lord Aylmer, and named by Lady Aylmer after the reigning king, the band of the 32nd Regiment attending.

She arrived at Montreal, May 2nd, and sailed from Quebec, August 24th on her first trip to Miramichi, P. E. Island, and Halifax. She finally left Quebec for London at 5 A.M. of August 4th, 1833, under the command of Captain McDougall, *steaming all the way*, but calling at Pictou for coal, and at Cowes, arriving at Gravesend, September 11th. These are the facts. Mr. Miles gave the date as the 18th, and Mr. McCord as the 5th, both doubtless quoting from untrustworthy authorities. Thus are historical errors perpetuated.

The facts contained in the following article relating to these early ships may be accepted as indisputable :—

"ROYAL WILLIAM."

SOME FACTS ABOUT THE LITTLE CRAFT.

*Quebec has the honour of building the first steamer that crossed the Atlantic—
built by a Scotchman.*

A writer in 'Chambers' Journal' says : " In many quarters the idea seems still to prevail that the first steamer to cross the Atlantic was the *Savannah*, which in 1819 made the voyage from the port of the same name in Georgia to Liverpool in twenty-five days. The *Savannah*, however, was not a steamship, and was under sail more than two-thirds of the way across. She was a full-rigged packet ship, and had on her deck a small steam engine, by means of which motion was given to the craft in smooth water when the wind failed. The log is full of such entries as : ' At 8 A.M. tacked ship to the westward ; ' ' Took in the mizzen and foretop-gallant sails ; ' ' Got the steam up, and it came on to blow fresh—we took wheels in on deck in thirty minutes ; ' ' Stopped wheels to clean the clinkers out of the furnace ; ' ' Started wheels,' and so on. In 1838, the *Sirius* and the *Great Western* successfully made the journey from England to America ; but five years before that date, Canadian enterprise accomplished the feat of bridging the Atlantic Ocean with a little vessel propelled wholly by steam. This was the *Royal William*, whose beautiful model was exhibited at the British Naval Exhibition in London, where she attracted the attention and curiosity of the first seamen in the empire. The

Royal William—named in honour of the reigning sovereign—was built in the city of Quebec by a Scotchman, James Goudie, who had served his time and learned his art at Greenock. The keel was laid in the autumn of 1830, and her builder, then in his twenty-second year, writes: 'As I had the drawings and the form of the ship, at the time a novelty in construction, it devolved upon me to lay off and expand the draft to its full dimensions on the floor of the loft, where I made several alterations in the lines as improvements. The steamship being duly commenced, the work progressed rapidly, and in May following was duly launched, and before a large concourse of people was christened the *Royal William*. She was then taken to Montreal to have her engines, where I continued to superintend the finishing of the cabins and deck-work. When completed she had her trial trip, which proved quite satisfactory. Being late in the season before being completed, she only made a few trips to Halifax.' The launching of this steamer was a great event in Quebec. The Governor-General, Lord Aylmer, and his wife were present, the latter giving the vessel her name. Military bands supplied the music, and the shipping in the harbour was gay with bunting. The city itself wore a holiday look. The *Royal William*, propelled by steam alone, traded between Quebec and Halifax. While at the last-named place she attracted the notice of Mr. Samuel Cunard, afterwards Sir Samuel, the founder of the great trans-continental line which bears his name. It is said that the *Royal William* convinced him that steam was the coming force for ocean navigation. He asked many questions about her, took down the answers in his note-book, and subsequently became a large stockholder in the craft. The cholera of 1832 paralysed business in Canada, and trade was at a standstill for a time. Like other enterprises at this date, the *Royal William* experienced reverses, and she was doomed to be sold at sheriff's sale. Some Quebec gentlemen bought her in, and resolved to send her to England to be sold. In 1833 the eventful voyage to Britain was made successfully, and without mishap of any kind. The *Royal William's* proportions were as follows: builder's measurement, 1370 tons; steamboat measurement, as per Act of Parliament, 830 tons; length of keel, 146 feet; length of deck from head to taffrail, 176 feet; breadth of beam inside the paddle boxes, 29 feet 4 inches; outside, 43 feet 10 inches; depth of hold, 17 feet 9 inches. On the 4th of August, 1833, commanded by Captain John M'Dougall, she left Quebec, *viâ* Pictou, Nova Scotia, for London, under steam, at five o'clock in the morning. She made the passage in twenty-five days. Her supply of coal was 254 chaldrons, or over 330 tons. Her captain wrote: 'She is justly entitled to be considered the first steamer that crossed the Atlantic by steam, having steamed the whole way across.' About the end of September, 1833, the *Royal William* was disposed of for ten thousand pounds sterling, and chartered to the Portuguese Government to take out troops for Dom Pedro's service. Portugal was asked to purchase her for the navy, but the admiral of the fleet, not thinking well of the scheme, declined to entertain the proposition. Captain M'Dougall was master of the steamer all this time. He returned with her to London with invalids and disbanded Portuguese soldiers, and laid her up at Deptford Victualling Office. In July, orders came to fit out the *Royal William* to run between Oporto and Lisbon. One trip was made between these ports, and also a trip to Cadiz for specie for the Portuguese Government. On his return to Lisbon, Captain M'Dougall was ordered to sell the steamer

to the Spanish Government, through Don Evanston Castor da Perez, then the Spanish ambassador to the court of Lisbon. The transaction was completed on the 10th of September, 1834, when the *Royal William* became the *Ysabel Segunda*, and the first war steamer the Spaniards ever possessed. She was ordered to the north coast of Spain against Don Carlos. Captain M'Dougall accepted the rank and pay of a commander, and, by special proviso, was guaranteed six hundred pounds sterling per annum, and the contract to supply the squadron with provisions from Lisbon. The *Ysabel Segunda* proceeded to the north coast; and about the latter part of 1834, she returned to Gravesend, to be delivered up to the British Government, to be converted into a war steamer at the Imperial Dockyard. The crew and officers were transferred to the *Royal Tar*, chartered and armed as a war steamer, with six long thirty-two pounders, and named the *Reyna Gobernadora*, the name intended for the *City of Edinburgh* steamer, which was chartered to form part of the squadron. When completed, she relieved the *Royal Tar*, and took her name. In his interesting letter, from which these facts are drawn, to Robert Christie, the Canadian historian, Captain M'Dougall thus completes the story of the pioneer Atlantic steamer: The *Ysabel Segunda*, when completed at Sheerness Dockyard, took out General Alava, the Spanish ambassador, and General Evans and most of his staff officers, to Saint Andero, and afterwards to St. Sebastian, having hoisted the Commodore's broad pennant again at Saint Andero; and was afterwards employed in cruising between that port and Fuente Arabia and acting in concert with the Legion against Don Carlos until the time of their service expired in 1837. She was then sent to Portsmouth with a part of those discharged from the service, and from thence she was taken to London and detained in the City Canal by Commodore Henry until the claims of the officers and crew on the Spanish Government were settled, which was ultimately accomplished by bills, and the officers and crew discharged from the Spanish service about the latter end of 1837, and *Ysabel Segunda*, delivered up to the Spanish ambassador, and after having her engines repaired, returned to Spain, and was soon afterwards sent to Bordeaux, in France, to have the hull repaired. But on being surveyed, it was found that the timbers were so much decayed, that it was decided to build a new vessel to receive the engines, which was built there, and called by the same name, and now (1853) forms one of the royal steam navy of Spain, while her predecessor was converted into a hulk at Bordeaux. This, in brief, is the history of the steamer which played so important a rôle in the maritime annals of Canada, England, and Spain. Her model is safely stored in the rooms of the Literary and Historical Society of Quebec, where it is an object of profound veneration. At the request of the Government, a copy of the model has been made, and will form part of the Canadian exhibit to the World's Fair at Chicago."¹

The honour, however, of building the first steamship expressly for the Atlantic trade, to cross *without re-coaling*, unquestionably

¹ The article in 'Chambers' Journal' was founded on a lecture delivered by Archibald Campbell, Esq., before "The Literary and Historical Society of Quebec," and on a work entitled 'Quebec Past and Present,' written by J. M. Lemoine, Esq., F.R.S.C.

belongs to Bristol, England, and the writer saw her launched on the 19th July, 1837. This was the *Great Western*, thus refuting the opinion of Dr. Lardner, given in a lecture at Liverpool, and reported in the Liverpool *Albion* of December 14th, 1835, in which he said—

"As to the project, however, which was announced in the newspapers of making the voyage directly from New York to Liverpool, it was, he had no hesitation in saying, perfectly chimerical, *and they might as well talk of making a voyage from New York or Liverpool to the moon.* The vessels which would ultimately be found the best adapted for the voyage between this country and the United States would be those of 800 tons, which would carry machines of 200 H.P."

Mr. Macgregor Laird ridiculed this in the *Albion* of December 28th, over the signature "Chimera." In the eighth and last edition of his book on the "steam engine," Dr. Lardner, however, declares that he never stated that a "steam voyage across the Atlantic was a *physical impossibility.*" This, of course, does not tally with his Liverpool lecture.

The *Great Western* was designed and built by William Patterson, of Bristol, of wood, for the "Great Western Steamship Company," and was launched July 19th, 1837. She was of unusual strength, her bottom being solid, and her frame secured with iron diagonal bracing. Her dimensions were $212 \times 35 \cdot 4 \times 23 \cdot 2$, 1340 tons gross, and 679 tons net,¹ with a round stern, and Neptune for a figure-head. Her engines, by Maudslay & Sons, of London, were 440 H.P. nominal, cylinders of $73\frac{1}{2}$ inches with 7 feet stroke. Lieutenant James Hosken, R.N., was her first commander, and afterwards B. R. Matthews. She sailed from Bristol on the

¹ There have been three systems of measurement in vogue in Great Britain. 1st. *Builders*, or the old measurement (O. M.) under the law of 1773, a very rough calculation. 2nd, New Measurement (N. M.) of 1834, amended by 6 & 7 Vict. ch. 84, and consolidated by 8 & 9 Vict. ch. 89: and 3rd, new new, measurement (N. N. M.), the present law enacted in 1854. The last was devised by Moorsom, and is by far the most scientific of the three; the ship being gauged in sections, just like a cask of wine. Under the law of 1834, engine, boiler, and coal spaces are deducted from the gross tonnage for dock dues, wharfage, &c. The Board of Trade, too, for a time allowed the space under spar (or upper) deck (as in the Allan boats) to be deducted, but this was abused through a clerical error in the Act, and has recently been repealed. There are also three modes of ascertaining the length of a ship, hence apparent disagreements in description; first, the keel; second, between perpendiculars; that is between the stem and stern post; and third, the length *on deck*, or *over all*. The official rule is between perpendiculars, but the length *on deck* is the popular method. Latterly the spaces occupied by crew and passengers have also been deducted from gross tonnage.



"GREAT WESTERN,"

Leaving Kingroad (Bristol), on her first voyage to New York, 8th April, 1838.
(From a painting by Walters in 1838.)

8th April, 1838, and arrived at New York on the 23rd, direct, in fifteen days. Her best day's run was 243 knots, and her average 208, or equal to 8·2 knots per hour, burning 655 tons of coal.

Commenting upon the arrival of the *Sirius* and *Great Western*, the *New York Courier and Enquirer* of April 24th, 1838, said—

"What may be the ultimate fate of this excitement—whether or not the expenses of equipment and fuel will admit of the employment of these vessels in the ordinary packet service—we cannot pretend to form an opinion; but of the entire feasibility of the passage of the Atlantic by steam, as far as regards safety, comfort, and despatch, even in the roughest and most boisterous weather, the most sceptical must now cease to doubt."

The *New York* papers of 24th April, 1838, advertise her thus—

"British Steam Packet Ship *Great Western*, James Hosken, R.N. Commander, having arrived yesterday from Bristol, which place she left on 8th inst. at noon, will sail from New York for Bristol on Monday, May 7th, at 2 P.M. She takes no steerage passengers. Rates in the cabin, including wines and provisions of every kind, 30 guineas; a whole stateroom for one person, 50 guineas. Steward's fee for each passenger, £1 10s. sterling. Children under thirteen years of age, half-price. No charge for letters or papers. The captain and owners will not be liable for any package, unless bill of lading has been given for it. 100 to 200 tons can be taken at the lowest current rates. Passage or freight can be engaged, a plan of cabin may be seen, and further particulars learned by applying to Richard Irvin, 98, Front Street."

She left New York 7th May, and arrived back on the 22nd.

While she was fitting out, the *Sirius*, Lieutenant Roberts, R.N., commander, built by Menzies, of Leith, 703 tons, 320 H.P., engines by Wingate, 178 feet \times 25½ \times 18½, trading between London and Cork, left London for New York, and arrived a few hours before her; but Mr. Johnson is in error in saying that she steamed from London to New York in 18½ days. She re-coaled at Cork, sailing from thence 4th April, and was eighteen days from Cork to New York, running out of coal, and burning spars, resin, etc.

In the *Marine News* of April 4th, 1838, published in New York, the agents of the *Sirius* advertise her as a "new and powerful steamship, 700 tons burden, 320 H.P." The advertisement continues—

"This vessel has superior accommodations, and is fitted with separate cabins for the accommodation of families, to whom every possible attention will be given.

"Cabin, \$140·00, including provisions, wines, etc.

"Second cabin, \$80·00, including provisions."

She left New York 1st May and arrived 18th. The *Great*

Western ran regularly for nine seasons, lying up in winter; and although the passage-money was so high, fifty guineas, she was a great favourite. Her best time East is said to have been 10 days, 10 hours, 15 minutes.¹ The company tendered to carry the mails, but failed to get the contract, and were ultimately beaten off by the heavily subsidised Cunard boats. She was sold to the Royal Mail Company for £25,000, ran for ten years between Southampton and the West Indies, and was finally broken up at Vauxhall in 1857. Her success immediately led to several other attempts, but only one endured for any length of time. The *Sirius* did not attempt a second voyage; but in July, 1838, Liverpool despatched another *Royal William*, the same size as her namesake, for New York. She belonged to the City of Dublin Steam Packet Company, was 817 tons, built by Wilson & Co., 175 × 27 × 17·6 feet, with engines of 276 H.P., by Fawcett & Preston. She was a failure in point of speed, having occupied 19 days going west, and 14½ going east. In October, 1838, the Liverpool Transatlantic Steam Company purchased from Sir John Tobin, and despatched the *Liverpool* from that port. She was 1150 tons and 468 H.P. (235 × 35 × 21 feet), but was slow and crank, and occupied 16½ days on her first passage from Cove of Cork, having put back there on the 30th October. She was afterwards improved and her tonnage increased by 393 tons.

On the 7th December, 1839, the *President* was launched on the Thames with great *éclat*. She was built by Curling & Young, 2366 tons, and 540 H.P. Her career was very brief, for in March, 1841, she left New York, and was never seen or heard of again. It was supposed that she struck an iceberg. Two other boats were temporarily employed, the *Oriental*, 1670 tons and 440 H.P., and the *British Queen*, 2016 tons and 500 H.P. (234 × 40). All these boats, however, were soon eclipsed by the subsidised Cunard boats, which for many years defied all competition.

SECOND EPOCH.

Wood to Iron.

The "Great Western Steamship Company," in 1840, decided on building a larger ship, and consulted the celebrated engineer, I. K. Brunel. With his usual boldness he advised an iron ship of 3000 tons, and Mr. Patterson was commissioned to build her. This was the *Great Britain*, which, when completed, was the most

¹ One writer says it was "about 13½ days."

magnificent ship then afloat. She was a beautiful model, with round sides ; a special graving dock was built for her, so as to avoid launching, and she was designed, like the *Great Western*, for a paddle ship. During her construction Mr. T. P. Smith brought his screw-boat, the *Archimedes*, to Bristol, and a series of experiments there convinced Brunel, and although the frames of the paddle-boxes were already up, he decided to alter her to a screw. She thus excited the deepest interest throughout Europe. It is said that no engineer could be found willing to build her engines of 1500 I.H.P. by contract, and that the company had to construct them. To forge her main shaft James Nasmyth invented his celebrated steam-hammer, and the screw-shaft was driven by



"GREAT BRITAIN" IN A GALE OFF LUNDY ISLAND.

four endless chains over a great drum. There were four cylinders, 88 inches diameter with 6 feet stroke. On the 19th July, 1843, Prince Albert came down from Windsor to christen her, and Her Majesty and many thousands of people visited her afterwards in London. She was $322 \times 51 \times 32$, 2984 tons gross. On her completion she drew a little more water than was expected, and her sides being round it was found impossible to get her through the locks of the harbour basin. Ultimately, after some delay, the coping-stones of the lock were removed, and she was released. Her success as a steamship was perfect ; but after a few trips to New York she ran ashore in Dundrum Bay, Ireland, on the 22nd September, 1846, through the culpable neglect of Captain Hosken (a lieutenant of

the Royal Navy !), and remained there all winter without receiving serious damage. The following summer she returned to Liverpool, and was sold to Gibbs, Bright & Co., who altered her rig, supplied her with new direct-acting engines of only 500 H.P., and ran her in the Melbourne trade for about twenty-one years. In 1882 she was converted into a sailing ship, as sound and as strong as when she was first built. She is now a coal hulk at the Falkland Islands.¹

There were many, however, who were not convinced of the suitability of iron for ships, and more who had no faith in the value of the screw. Both, therefore, made slow progress for some years after 1843.

As far back as 1809 Trevethick proposed an iron ship, and in 1815 Dickenson patented an invention for iron boats, but the prejudice against iron was so strong, and especially on the part of the Admiralty, that it came to nothing practical. In 1818 the first iron vessel was built by Thomas Wilson, at Faskine, 11 miles from Glasgow, the *Vulcan*, and fifty-seven years afterwards she was still carrying minerals on the Clyde! In 1821 the first iron steamship, the *Aaron Manby*, was built at Horsley, for the joint account of Mr. Manby and Captain, afterwards Admiral, Sir Charles Napier, followed by two or three other small vessels. Shortly afterwards an engineer at Paris commenced to build, but failed. The Shannon Steam Packet Company built one in 1824, and Fawcett and Preston soon afterwards built several small iron vessels at Liverpool, and the Thames followed suit. In 1832 Lairds, of Birkenhead, were the first to build an iron steamship for ocean navigation, the *Elburkah*, of only 55 tons, to ply on the River Niger. In 1834 they built the *Garry Owen*, 125 × 21'6, with two engines of 90 H.P.; and in 1837 two for the East India Company, for the *Indus*, of 350 tons; and in the same year the *Rainbow*, of 600 tons and 180 H.P., for the London General Steam Navigation Company, the largest iron steamship then afloat. From this it may be seen what a bold experiment the *Great Britain* was in 1840. Two of the objections to iron steamships, the deviation of the compass and the rapid fouling of their bottoms, were both eventually overcome, the former by Gray's floating compass, and the latter by anti-fouling composition for painting the bottom.

¹ William Patterson was a modest, unassuming man, but with a genius for shipbuilding. He afterwards built a magnificent wooden steamship, the *Demerara*, of 3000 tons. She stranded in going down the River Avon, and this ruined him.

THIRD EPOCH.

The Screw Propeller.

It is impossible to decide who was the inventor of the screw propeller. It has been claimed by many. Mr. McGregor says "the use of the screw propeller may be of an indefinite antiquity." It has even been claimed for the Chinese as far back as 1680. In 1745 Masson describes an apparatus for working an oar at the stern of a vessel so as to give it a sculling motion. In 1746 Bougnier mentions that revolving arms, "like the vanes of a windmill," were tried for the propulsion of vessels. Watt suggested it in 1770. In 1779 Matthew Wasborough, of Bristol, took out a patent for one. In 1785 Joseph Bramah speaks of one, "similar to the fly of a smoke-jack," and in 1798 he tested it in a boat. In 1800 Edward Shorter patented a "perpetual sculling machine," having the action of a two-bladed propeller, which was tried in 1802 in H.M.'s ships *Dragon* and *Superb*.¹ In 1804 Stevens, of New York, crossed the Hudson in a small boat propelled by two screws and took her to the Delaware.

In 1815 Richard Trevethick patented "a worm or screw revolving in a cylinder at the head, sides, or stern of a vessel." In 1826 Woodcroft patented a mode for "propelling boats and vessels," but gave no specification. In 1832, however, he prolonged his patent and fully described his "increasing pitch screw propeller," which, when tried, proved very successful; and in 1844 he patented his "varying pitch screw propeller," which was certainly in advance of any other at the time. In 1823 a Captain Delisle tried two on a small scale in France, and Sauvage tried another in 1832.

In 1833 Robert Wilson, a Scotch engineer, says he brought under the notice of the Admiralty a screw, "perfect in all its details," which was rejected.² But in 1836, John Ericsson, a Swede settled in London, fully demonstrated the value of the screw. He first tried it in a model boat only twenty inches long, and then had a boat built 45 x 8 feet, in which he fitted his engine, and *two propellers* of 5 feet 3 inches, both being on the same shaft. This was the *Francis B. Ogden*. The result was far beyond his most sanguine expectations, for she made ten miles an hour, and afterwards towed a large packet ship, the *Toronto*, at the rate of five miles an hour. Next he towed a barge with the

¹ Woodcroft.

² 'The Screw Propeller,' by R. Wilson. 1860.

Lords of the Admiralty and three admirals on board at the rate of ten miles an hour ; but scientific theorists, and many engineers, declared that it was constructed on erroneous principles, and its failure certain, while the admirals decided that the ship would not steer.

In 1836, too, Thomas Pettit Smith, six weeks before Ericsson, patented "a screw or worm made to revolve rapidly under water in a recess or open space, formed in that part of the afterpart of the vessel commonly called the dead-rising, or dead wood of the stern."

His first trial, in a boat of six tons with a 6-inch cylinder and 15-inch stroke, was so successful that on the 29th July, 1839, the "Screwship Propeller Company" was formed to purchase the patent. The Company tried it on a larger scale, 14th October, 1839, in the *Archimedes*, of 237 tons ($125 \times 22 \times 13$), with a cylinder of 37 inches and 3 feet stroke, 45 H.P. The screw consisted of two half-threads, 8 feet pitch, and 5 feet 9 inches in diameter. The engine made 26 and the screw 138 revolutions per minute, with multiplying gear. Mr. Smith expected a speed of 12.60 miles an hour, but she only made 9.25, showing considerable loss by "slip." Her engine, however, was not sufficiently powerful for the size of the boat. These experiments decided the practical value of the screw. Brunel adopted it for the *Great Britain* in 1842, and the Admiralty ordered the *Rattler*, of 888 tons, to be built at Sheerness. She was launched in April, 1843, and proved a great success.

It was 1850, however, before David Tod, of Glasgow, brought it into general use. It seems clear, therefore, that the credit for bringing it into practical application must be shared by Woodcroft, Ericsson, and Smith.

In 1838, a friend of Ericsson's, Mr. Stockton, an American, had a small iron screw-boat, the *R. F. Stockton*, built by Laird, of Birkenhead (70×10), and sent her to the United States, where she was employed as a tug boat. Ericsson himself went to New York, and died there in 1889, after a very long and useful career.

FOURTH EPOCH.

The Compound Engine.

Randolph, of Randolph, Elder & Co., Glasgow, first introduced the compound engine in paddle boats for the Pacific Company in 1856, but it did not come into general use until 1870.

Alfred Holt, of Liverpool, tried it successfully in his boats in the

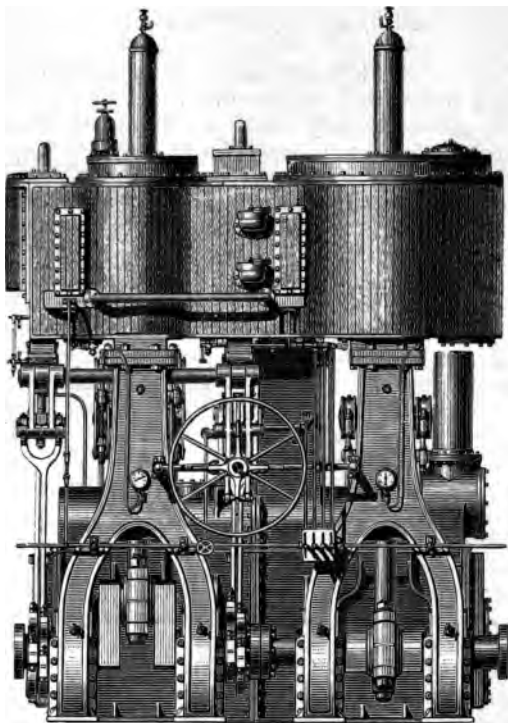
China trade in 1865, running direct from Liverpool to the Mauritius, 8500 miles, without re-coaling. In 1868 the National Company tried it in the *Italy*. The opening of the Suez Canal on the 17th November, 1869, gave an immense impetus to screw steamships for the Indian, Chinese, and Australian trades, and, combined with the compound engine, created a revolution in the carrying trade of the world, which has proved almost fatal to sailing ships, especially as they are unfit for the Canal or the Red Sea.

To understand this it is only necessary to remember that the first Cunard boats could only carry 225 tons cargo and 90 passengers, and could only steam 8·7 knots per hour, on an average, consuming 4·7 pounds of coal per I.H.P. per hour, while the first of their screw compound boats, the *Bothnia*, built in 1874, carries 3000 tons of cargo, and 340 saloon passengers, besides steerage, and steams on an average 13 knots, consuming only 2·2 pounds of coal per I.H.P. per hour, her engines being only 507 H.P. nominal, against 425 in the *Acadia*, of 1840.¹ In the simple engine the steam passed at low pressure from the boilers to the cylinder, where it did its work, and then passed direct to the condenser. But in the compound it passes at very high pressure into a small cylinder, and thence by expansion into a large one, and thence, in the triples, to a still larger one, before it passes into the condenser. The *Mongolian's* cylinders, for example, are 30, 50, and 80 inches in diameter respectively, with 5 feet stroke. The *Friesland's* are 35½, 56, and 89 inches, with 4½ feet stroke. Of course they do not do three times the work of the old engines, but, as the cranks are set at different angles, much greater power is obtained.

Steam is now used in marine steel boilers up to 200 lbs. pressure to the square inch, instead of at 13 lbs. in the early boats; but as it requires very little more coal to raise 200 lbs. than 13 lbs. the consumption of coal has been gradually reduced from about 5½ lbs. to 1½ lbs. per I.H.P. per hour. Experts tell us that to convert a quantity of water at 32° into 10 lbs. of steam requires one cwt. of coal; into 40 lbs. it requires only 1·012; and into 90 lbs. only 1·024 lbs. One of Napier's engines, in the Russian ship of war *Sinope*, recently consumed only 1·45 lbs. per hour at full power, and the *Empress of Japan*, of the C. P. R. line, consumed only 1·56 lbs. on her trial trip. "Forced draught" has also been introduced, which causes a more perfect combustion of the fuel; but much depends on the quality of the coal, the work of the firemen,

¹ Sir John Burns.

and the character of the boilers. Warm water is also returned from the condenser to the boilers, which is another economy, and the steam is "super-heated" to increase its power. The *Daventry*, by using an "evaporator," has raised the water to 170° Fahr., and the *Enchantress*, by means of a "feed-heater," has raised it to 210°, which must economise the consumption of coal.



COMPOUND ENGINE.

Some one professes to have discovered a means of returning steam to the boilers, which, if successful, would of course produce another revolution in steam engines. Quadruple cylinders have also been adopted in a few ships. There is still plenty of room for further reduction in the consumption of coal, as, according to Mr. Merrifield, F.R.S. ('Text-books of Science'), no steam

engine, as yet, does one-fifth of the work which, theoretically, it ought to do *if all the heat produced by the combustion of the coal were utilised*. It will doubtless soon be reduced to 1 lb. per I.H.P. per hour, or even less.

The early screws could only run about 3000 knots at full speed without re-coaling, but compound engines now enable them to run about 10,000 knots, and still more at reduced speed. Large steel boats of moderate power and speed now carry immense cargoes of dead weight, so that sailing ships have no chance against them. Thus, the *Rossmore*, 4360 tons gross, carries 6800 tons of cargo, besides coal, and steams 12 knots with engines of only 2500 I.H.P., or about 500 nominal. The *Georgian*, of 5800 tons gross, is said to carry 7000 tons of cargo besides coal, or nearly 60 per cent. over her tonnage; and the White Star freight-boat *Cevic* recently cleared from New York for Liverpool with the following enormous cargo :—

144,000 bushels of grain.
 9,000 bales of cotton.
 896 head of cattle.
 1,130 tons flour, copper, meats and hay.
 3,000 boxes cheese.
 2,600 barrels oil and wax.
 2,000 bales hides.¹

Iron and wooden sailing ships only carry 40 to 45 per cent. over their tonnage. Steamships, however, have been greatly overdone, and freights have been reduced to ruinous rates. Thus, wheat has been carried from Montreal to Liverpool at 4½ cents per bushel (formerly 25 to 30 cents), and iron from Glasgow to New York at 2s. 6d. per ton (formerly 25s.), and grain from New York to Liverpool at 4 cents per bushel, or less.

FIFTH EPOCH.

Steel Ships.

Steel ships did not come into vogue until about 1879. The British Admiralty first tried it in the *Iris* in 1875. The Siemens-Martin steel proving much stronger than iron at about the same price, it was found possible to reduce the weight of material, and thus to reduce the ship's cost. Not only so, but as the ships floated lighter, they could carry considerably more cargo than iron ships of the same size. In 1879 the Allans built the *Buenos Ayrean* of steel; but the proportion of steel to iron tonnage built

¹ Since this was written the *Georgic*, a freight boat carrying 14,000 tons, has been launched from the yard of Harland & Wolff, Belfast.

on the Clyde was only $10\frac{1}{2}$ per cent. In 1880 the Cunard Company decided to try it in the *Servia*, and so rapidly did it come into favour that in 1889 97 per cent. of the Clyde tonnage was built of steel, and on the Tyne and other shipbuilding centres the proportion was much the same. Steel has been at a remarkably low price for some time, and ship plates are now sold as low as £4 15s. per ton, = \$23, less than 50 per cent. of their cost twenty years ago. The result is that the shipyards of Great Britain and Ireland stand unrivalled, and have produced 1,250,000 tons of shipping in a single year for all nations except the United States.

SIXTH EPOCH.

Twin Screws.

The *City of New York*, of the Inman and International line, in 1888 adopted twin screws, but she was by no means the first to do so. They were, in fact, tried by Stevens, on the Hudson, in a small boat as far back as 1804, but she failed because, it is said, he could not make the stern pipes tight. Ericsson, too, tried them in a very ingenious way, on one shaft, in the *F. B. Ogden*, on the Thames in 1836, with great success. But the *City of New York* was the first of the North Atlantic passenger fleet to adopt them. They have not increased the speed much. The *Etruria*, a single screw, has averaged 19·65 knots per hour, Queenstown to Sandy Hook, while the best run of the celebrated *City of Paris* only averaged 20·70, and that of the *Teutonic* 20·349. But they have added immensely to the *safety* of the ships, for many reasons, and it may be as well to explain them.

The dangers to which the ordinary screw steamship is exposed may be classed under five heads:—

1. Fracture of main shaft, as in the case of the *City of Brussels*, *Circassian*, *Umbria*, *Sarnia*, and many other ships.
2. Loss of screw or its fans, as in the case of the *Peruvian* and *Sardinian*.
3. Loss of rudder or damage to it, as in the case of the *Great Eastern* and *Alaska*.
4. Breaking down of the machinery, as in the case of the *Aurania*.
5. Collision between two ships or with rocks, as in the case of the *Oregon*, *Idaho*, and *City of Chicago*.

The first four render a single screw steamship helpless, and she can only reach port by being towed, or by the very tedious process of sailing under her own canvas.

The fifth is usually fatal, as the cross bulkheads are generally misplaced or too weak to withstand the pressure of a large body of water.

Now ships with twin screws have two independent sets of engines and boilers, and in this fact is found their immunity from most of the dangers inherent in all single screw ships ; indeed, it may be said to exempt them from the consequences of the first four sources of danger, and even in the fifth case it may prolong the ship's life, or lead to her rescue. How? Let us see.

1. It is impossible, in most cases, to repair a broken shaft at sea, but in a twin screw the only effect is to diminish her speed about one-third, say from 18 to 12 or 13 knots. As a matter of fact, the *City of New York* once made 38½ knots with one screw in 24 hours, an average of nearly 16 knots per hour.

2. This kind of accident is a very common one. The screw cannot be replaced at sea, but in a twin the effect is no worse than in the first case. Many things cause the loss of a screw. The *Scythia* lost hers by striking a whale ; the *Peruvian* by striking field ice ; the *Sardinian* through breaking the end of her main shaft. Floating timber, too, or a sunken wreck may cause it. But from all these accidents a "twin screw" is virtually free ; or rather, if they do occur, the second screw is usually available.

The 3rd is also a very common accident, and renders a single screw ship perfectly helpless. The *Great Eastern* became unmanageable, but having paddle wheels, slowly returned to Queens-town. The *Sardinian* transferred her passengers in mid-ocean, and the *Alaska* was assisted into New York by the *Lake Winnipeg*.

But in a twin screw it is possible to overcome even this disaster. By modifying the speed of the one screw or the other, as may be necessary, it is quite possible to make a fair course, sufficiently so to take the ship near to her destination, when a tug can easily be procured to assist her into port. This is exactly what the *Paris* did on a recent occasion. She has also the great advantage of being able to turn a circle in about her own length—an immense advantage in a narrow channel, or when fighting an enemy, as every sailor knows.

The 4th is a kind of accident occurring from a variety of causes. Machinery can often be repaired at sea, as duplicates of many parts are carried ; but in many cases it cannot : cylinders crack, air pumps, piston rods, or condensers break, and the engine is rendered useless. The *Aurania* broke a connecting rod, which smashed the cylinder, and she drifted about until picked up by

tugs. A paddle boat usually has two engines, and, unless the main shaft breaks, she can go ahead slowly with one engine, or even with one paddle ; but in a single screw, if one cylinder is disabled, the others will probably be rendered useless, because the steam passes from the high-pressure cylinder through the intermediate into the low, and thence into the condenser. But in a twin screw the total breakdown of one engine only involves a diminution of speed.

5. Collisions have recently become a source of terrible disaster to iron ships, and here again the utility of twin screws is seen. In a single screw further protection is obtained by means of cross watertight bulkheads, when properly placed and constructed, though they have too often failed by an injudicious manipulation of doors through them. Double bottoms are also a great protection when a ship strikes on a sandy or level bottom, or even on rocks. In collisions between two iron ships, one usually escapes if she has a strong collision bulkhead near her bows, but the other too often sinks in a few minutes from defective bulkhead arrangements, as referred to above, as has recently been illustrated in the case of H.M.S. *Victoria* and *Camperdown*, and of the North German Lloyd steamer *Elbe* and the *Crathie*.

The Cunard steamship *Oregon*, of 7000 tons, was sunk by a miserable little wooden schooner which struck her in a vital part near the engine-room. Her bulkhead might have saved her, but it was pierced by sliding doors ; the grooves were filled with small coal, and the doors could not be closed in time.

Twin screws having two independent sets of engines and boilers have generally in their engine-room a *central longitudinal* bulkhead running from the keelson to the main deck. The effect of this is threefold. (1.) It cuts the spaces in halves ; (2.) It strengthens the transverse bulkheads : (3.) It effectually separates the two sets of engines.

There remains to be considered one other danger, common to all ships, and perhaps the most terrible of all to landsmen—that of fire. The great advantage of an iron or steel ship, and especially of a twin screw, over a wooden ship is, that the fire may possibly be confined to one section and drowned out with water or steam from steam pumps or direct from the boilers without the passengers even being terrified by smoke. This was actually done in the case of the *City of Richmond* as well as in other ships.

Twin screws, too, reduce the necessity for sails, and thus the great resistance offered by cumbrous masts, yards, and rigging is lessened, simple pole masts having in most cases been substituted.

This adds much to the ship's speed in head winds, and raises the average speed of the voyage considerably. Hence the wonderful regularity of the passages of such ships as the *Paris*, *Teutonic*, and *Lucania*, all twin screws, and all fitted with pole masts without yards.

The U.S. warships *Columbia* and *Minneapolis*, recently built at Philadelphia, have "triple" screws, one in the centre, and one on each quarter ; the latter made 21·8 knots, as the mean of 4 hours' sea trial.

CHAPTER VI.

SPEED CALCULATIONS.

SOME confusion often occurs in the minds of non-professional people as to the speed of steamships. Every ship has, in fact, three standards of speed, and it may be as well to state them clearly :

1. There is the builder's trial of speed *on the measured mile*, which is her maximum under the most favourable circumstances ; fine weather, smooth water, light draught, clean bottom, fresh-mined coals, and picked firemen.

2 There is her sea speed in fine weather, which will always be less, except when running before a strong, fair wind, owing to mixed or inferior coals, foul bottom, head sea, or careless firemen. Supposing her speed on the measured mile to be 19 knots, her sea speed will rarely exceed 17 to $17\frac{1}{2}$.

3. There is her *average* sea speed on a long voyage, which, in ordinary weather, will probably not exceed 16 to $16\frac{1}{2}$, and in continuous bad weather, with strong head winds and sea, may be much less. To ascertain her *average sea* speed, therefore, it is necessary to take a series of voyages.

The *City of Paris* made 21·9 knots on her builder's trial, but she has never averaged over 20·7 on her quickest sea passage, and her average speed is barely 20 knots, although she has only pole masts and no yards. The *Teutonic* made 21 on her trial trip, but only 20·349 on her celebrated passage of 5 days 16 hours 31 minutes, and her average speed is less.

CHAPTER VII.

THE CUNARD LINE AND ITS COMPETITORS.

It is now time to turn to the history of the various lines of steamships, and first I take the most remarkable and successful line the world has ever seen, in which Canada has again had a considerable share, viz., "The British and North American Royal Mail Steamship Co.," familiarly known as the "Cunard Line."

Mr. Johnson, however, is not correct in terming it the first Atlantic line, as the "Great Western Steamship Co." was formed at Bristol, and went into operation two years in advance of it. The combination of talent, energy, foresight, and pluck which originated and carried on this wonderful company with a success quite unparalleled was very remarkable.

Two Nova Scotians, both men of great ability and energy, share the honour of originating it, and three Scotchmen of equal ability, assisted in working it out.

Samuel Cunard was a member of a well-to-do Quaker family which had emigrated from Wales to America early in the 17th century and settled in Philadelphia. When the United States declared their independence, the family emigrated to Halifax, N.S., where Samuel was born in 1788. After serving in a merchant's office he accepted a partnership in a shipowning firm of Boston, Mass. In 1815 he proposed to the Admiralty to undertake, at his own risk, the conveyance of mails between Boston, Newfoundland, and Bermuda, and carried out his scheme most satisfactorily to the British Government.¹ As early as 1830 he contemplated the establishment of a line of steamships to run between Liverpool, Halifax, and Boston. The arrival of the *Royal William* at Halifax from Quebec in 1831 gave a fresh impetus to the idea, and we find him taking the greatest interest in her, and acting as a director of the company. Mr. Cunard acted as agent in Halifax for the "Hon. East India Company," and in 1838 he proceeded to

¹ A. Fraser-Macdonald, p. 80.

England and consulted Mr. Melvill, the Secretary of the East India Company, which had just launched the *Hugh Lindsay*, and asked Mr. Melvill to favour him with an introduction to any ship-builder likely to join him in carrying out his project.

Mr. Melvill gave him a letter to Robert Napier, of Glasgow, one of the most celebrated marine engineers the world has ever seen. This was the first fortunate step, as we shall see. Napier introduced him to two other remarkable men—George Burns (whose father had been for seventy-two years minister of the



Stevenson

Barony Parish, Glasgow), and David McIver, of Liverpool. In 1824 Mr. George Burns had engaged in steam navigation between Glasgow and Belfast, and in 1829 between Glasgow and Liverpool. Mr. David McIver was at that time associated with a rival company trading between Glasgow and Liverpool, but a little later both companies were amalgamated, and thereafter the Burns's and McIver's worked together. Mr. Burns, in recalling this important epoch in his life, said that "it was not long before we began to see daylight through the scheme, and I entertained the proposal

cordially, and invited Mr. Cunard to dine with me." Mr. McIver, however, at first, was dead against it, and after dinner advised that Mr. Cunard should be told "that the thing would not suit them." They breakfasted with Mr. Cunard next morning at Robert Napier's house, went further into the details of the scheme, and agreed to co-operate with Mr. Cunard in finding capital and ships should he succeed in obtaining a mail contract. David McIver



*Yours Sincerely,
George Burns*

died in 1845 and was succeeded by his brother Charles, also a very remarkable man, with a singularly sound judgment of men and business and of tremendous energy. Such was the combination. Cunard was a clever manager of men, and superintended the Government contracts and the management of the House of Commons in London. Burns superintended the construction of the ships in the Clyde; McIver managed them in Liverpool, and Mr. Cunard's sons in Halifax. Napier's engines were the

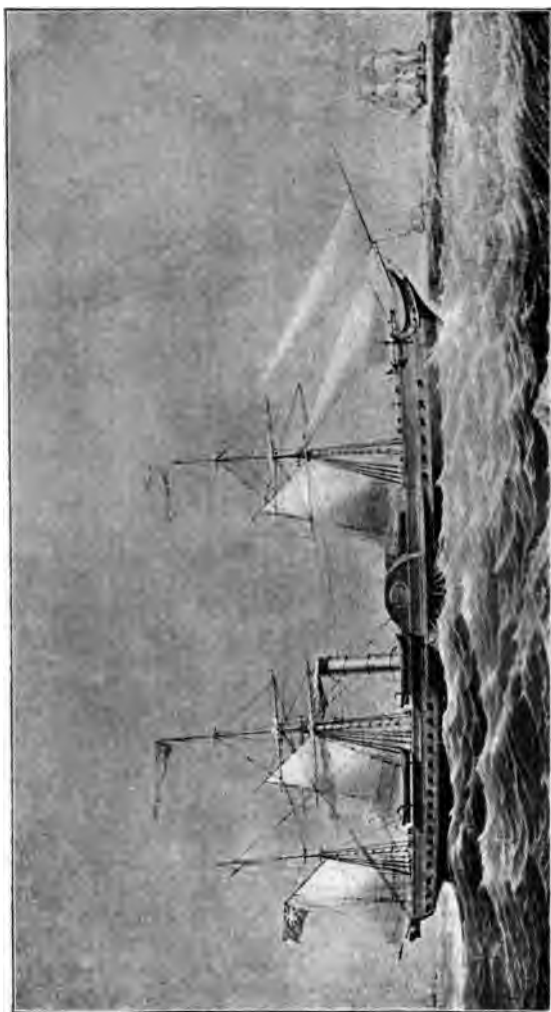
perfection of workmanship, so much so that an American engineer told the writer that the *Cambria's* engines were so superbly finished that they "ought to be put under a glass case."

While Cunard was negotiating with the British Government, by a singular coincidence, Hon. Joseph Howe, Judge Haliburton ("Sam Slick"), and two other Haligonians who had left Halifax for London on the 26th April, 1838, on board H.M. 10-gun brig



David Mac Inn

Tyrian with the mails, were overtaken by the *Sirius* steamship from New York, which stopped, took on board the mails, and was soon out of sight. Howe went on board the *Sirius*, and was so impressed by the incident that he at once foresaw that Halifax would be "nowhere" without steamships, and held many warm discussions with his friends. The result was that on their arrival he and Haliburton went to Bristol, and conferred with the directors



"BRITANNIA."

of the Great Western Company, who offered at once to run a line of steamships to Halifax if the Government would grant a subsidy for the carriage of the mails. Cunard, hearing of the efforts of Howe and Haliburton, met them in London with his own proposals. Meeting two New Brunswickers there, Messrs. Bliss and Crane, they made strong representations to the Government, and on the



HON. JOSEPH HOWE.

24th August Howe prepared a letter on the subject addressed to Lord Glenelg, signed by himself and Mr. Crane.¹

The outcome of it was, that in October the Admiralty advertised for tenders.

The Great Western Steamship Company tendered and anticipated no serious opposition, but, much to their chagrin, Mr.

¹ Geo. Johnson, in *Montreal Gazette*.

Cunard's tender was accepted, and a contract signed by Samuel Cunard, George Burns, and David McIver. The original conditions were that for the sum £55,000 sterling per annum, they were to supply three suitable steamships to run twice a month for eight months, and once a month in winter, twenty round voyages a year for ten years to Halifax and Boston; afterwards it was thought desirable to have fixed days for departure on both sides of the Atlantic, and for over forty years the boats left Liverpool on Saturdays, and Boston or New York on Wednesdays.

By a subsequent arrangement they agreed to provide four boats instead of three, and, subject to some other conditions, the subsidy was raised to about £81,000 per annum.¹ (Mr. Cunard, in his evidence before a committee of the House of Commons in 1846, stated it at £3295 sterling per round voyage.)

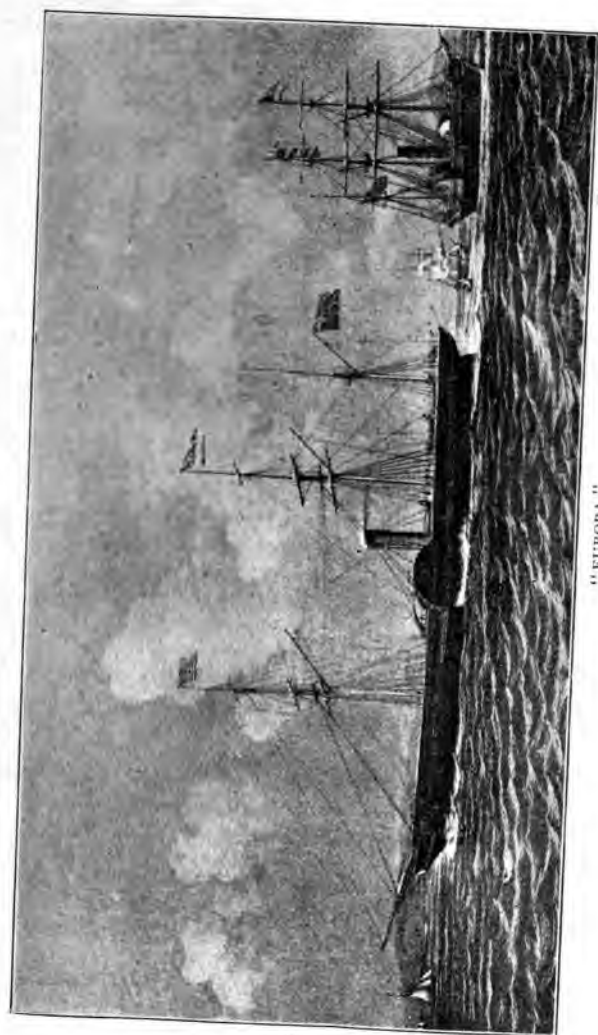
They then built on the Clyde four wooden paddle boats, all alike. The *Acadia* was built by John Wood; the *Britannia* by R. Duncan; the *Caledonia* by C. Wood; and the *Columbia* by Robert Steele. They were 207 feet long, 34 feet beam, and 24'4 feet deep, 1155 tons gross, and 619 net, their dimensions and model being very similar to the *Great Western*. All four engines were constructed by Robert Napier on the "side lever" principle, with 72½ inch cylinders, 6 feet 10 inches stroke, 425 H.P. nominal, and 740 H.P. indicated; consuming 38 tons of coal per day, or 4'7 lbs. per I.H.P. per hour. Their average speed varied from 8'3 to 8'7 knots per hour.² On the 4th July, 1840, the *Britannia* commenced the service from Liverpool, and was 14 days 8 hours to Boston, or excluding 12 hours at Halifax, 13 days 20 hours.³ Mr. Cunard went out in her, and during his stay in Boston is said to have received no less than 1873 invitations to dinner.⁴ The Bostonians were very enthusiastic over the new ship, and gave a banquet in honour of the event. In February, 1844, the *Britannia* was frozen up in Boston harbour, when to save her from delay the citizens, at their own expense, and with the aid of thousands of volunteers, cut a channel through the ice seven miles long and set her free! Their punctuality, comfort, and freedom from accident gave great satisfaction to the public. The Great Western Company succeeded in getting a Parliamentary inquiry into the contract, but the committee reported in favour of the Cunard Company and added that "the service had been most efficiently performed."

¹ Lindsay's 'History of Merchant Shipping.'

² John Burns.

³ The *Acadia*, however, did it in 11 days 4 hours afterwards.

⁴ A. Fraser-Macdonald.



"EUROPA."

A small boat to run between Pictou and Quebec, the *Unicorn*, was, however, the first Atlantic boat to reach Boston on 2nd June, 1840.

The only loss the company met with for thirty years was the *Columbia*, wrecked on Cape Sable, but, happily, no loss of life or mails occurred.

She was replaced in 1843 by the *Hibernia*, 219 × 35'9 × 24'2, 1422 tons gross, 791 net, and 500 H.P. nominal, 1040 I.H.P., and about half a knot faster. In 1845 the *Cambria*, a sister ship, was added, and proved faster still, averaging 9'6 knots. She was known as the "flying *Cambria*."

The Americans were, naturally, chagrined at the loss of their passenger and fine goods traffic, but courageously held on to their famous sailing packets (then among the finest in the world), increasing their size and speed.

But it was all in vain; they were doomed, and were gradually driven out of the trade. In 1845 they resolved to try an auxiliary steam engine, and built the *Massachusetts*, a wooden ship of 751 tons, 161 × 31'9 × 20. Her engine was designed by Ericsson and fitted with his lifting screw, the blades of which turned up when under sail. The engine was very compact, 170 H.P., sufficient to drive her nine knots in a calm, consuming only 9 tons of anthracite coal per day. Her total cost was only £16,000 sterling. Auxiliary engines, however, have never been successful in merchant ships; and after making two voyages to Liverpool, she was sold to the United States Government and re-named the *Farralones*. About 1870 the Government sold her, when her machinery was removed, and she again changed her name to the *Alaska*.

But Americans are not easily beaten, and although they were not yet prepared to run against the Cunard Line, they established a line of their own between New York, Southampton, and Bremen; and in June 1847 they started their first ship, the *Washington*, on the same day that the *Britannia* left Boston, boasting that "she was bound to win the race." She was 1750 tons gross, and her engines were said to indicate 2000 H.P. Her cylinders were the same diameter as the *Britannia*'s, 72 inches, but they had 10 feet stroke, and her boilers could carry 30 lbs. of steam. Nevertheless the *Britannia* won the race by two full days. The *London Times* described the *Washington* as an "elongated three-decker, and about as ugly a specimen of steamship building as had ever been seen at Southampton." She was followed by a similar boat, the *Hermann*, but after a short trial both were withdrawn.

In the next year (1848), the increasing wants of the trade

induced the British Government to make a new contract with the Cunard Company for a weekly line. The new subsidy was no less than £156,000 sterling per annum, and it was arranged that the boats should run alternately to New York direct, and to Halifax and Boston.

To fulfil this contract the company built four larger and faster wooden boats on the Clyde, all nearly alike in dimensions and power, the *America*, *Europa*, *Canada*, and *Niagara*. The *Europa* was built by John Wood, and the others by Robert Steele. The exact dimensions of the *Canada* were $251 \times 38 \times 25 \cdot 7$, 1825 tons gross, 1001 net, cylinders 90×8 feet stroke, 689 H.P. nominal and 2000 indicated, by Napier, the boiler carrying 13 lbs. steam. Her average speed was $10 \cdot 5$ knots.¹

In 1850 also the company contracted to supply branch boats at Halifax of 350 tons and 80 H.P., to carry the mails to St. John's, Newfoundland, and to Bermuda, and in 1851 St. Thomas was added.

The total subsidy was then no less than £178,000 sterling per annum, and this the company enjoyed for many years. The *Europa* was afterwards lengthened, and the *Niagara* and *Canada* converted into sailing ships.

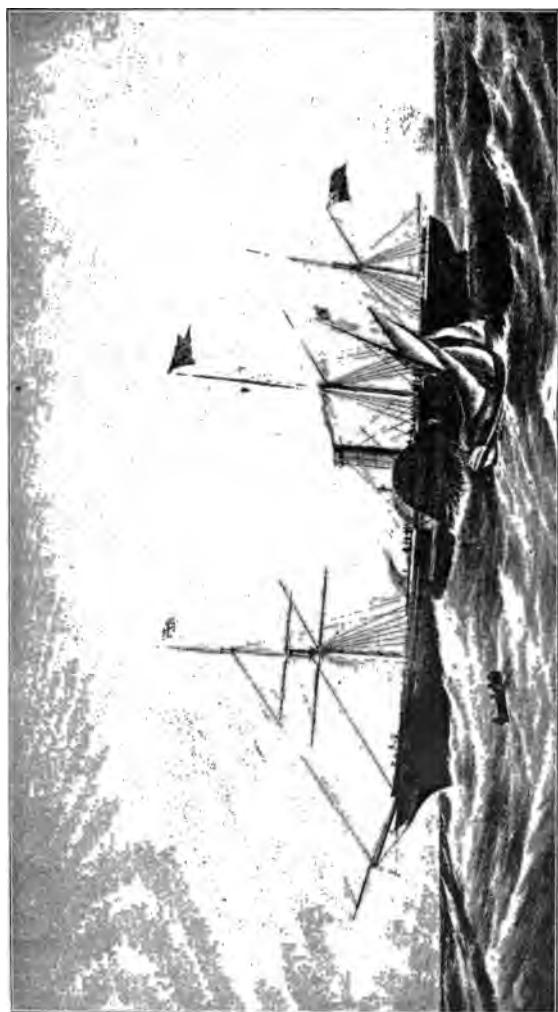
The Americans also subsidised a fortnightly line to Southampton and Havre. The *Franklin* and *Humboldt* were built to carry it out, but they were both wrecked. They were replaced by the *Arago* and *Fulton* in 1856, but both were ultimately withdrawn.

The "Collins" Line.

Hitherto the United States Government had been opposed to all subsidies on principle, but Americans now became intensely jealous of the British, and the Senate made several official reports complaining of "The Queen of the Ocean levying her imposts upon the industry and intelligence of all the nations that frequent the highway of the world." In 1849 they decided to subsidise a line of steamships of extreme speed, that should "run the Cunarders off the Atlantic," and "sweep the seas in war." How they succeeded we shall soon see.

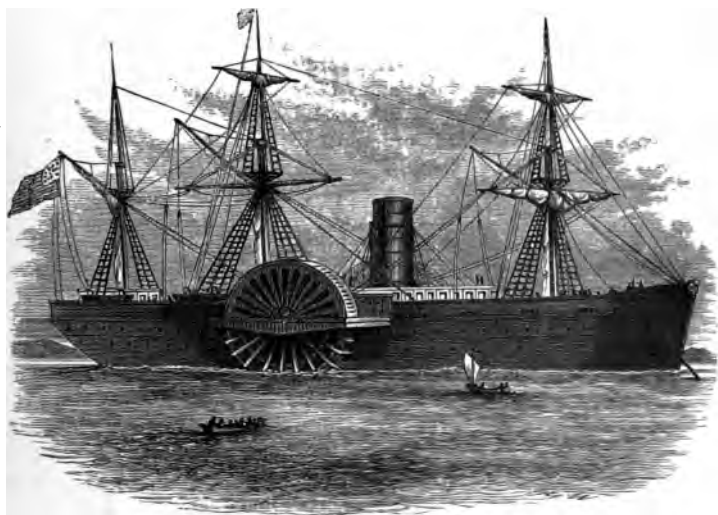
The Government made a contract with Mr. E. K. Collins, of New York, to build five (afterwards reduced to four) first-class wooden steamships of about 3000 tons, to perform twenty round voyages each year, at \$19,250 (£4000 sterling) per voyage. They

¹ John Burns.



"ASIA."

were named the *Arctic*, *Baltic*, *Atlantic*, and *Pacific*. The *Arctic* was considered the finest ship. She was designed by George Steers, of New York (of *America* yacht fame), and built by W. H. Brown, of New York, at a cost of \$700,000. They were good models, with solid frames of live oak, planked with pitch pine, and strengthened with diagonal iron straps, $282 \times 45 \times 32$, 2856 tons gross. The engines were designed by Faron (a Government engineer), after a careful study of the Cunard boats, and built by the Novelty and Allaire Companies; side lever, cylinders



COLLINS SS. "ATLANTIC."

95 inches, with 9 feet stroke, 800 H.P. nominal, and the boilers carried 17·5 lbs. of steam and consumed 87 tons of coal per day.¹

Mr. Faron was sent to England to spy out the Cunard Company's engines and boilers, and nothing was left undone to ensure success. The cabins, too, were superior in elegance and luxury to any British ship, and the state-rooms were fitted with electric bells, but the discipline was far inferior to the Cunard ships.

Their cost, however, so far exceeded the estimate that the Government not only had to make the company an advance, but, influenced by the frequent appeals of Senator Bayard, agreed to

¹ C. B. Stuart.

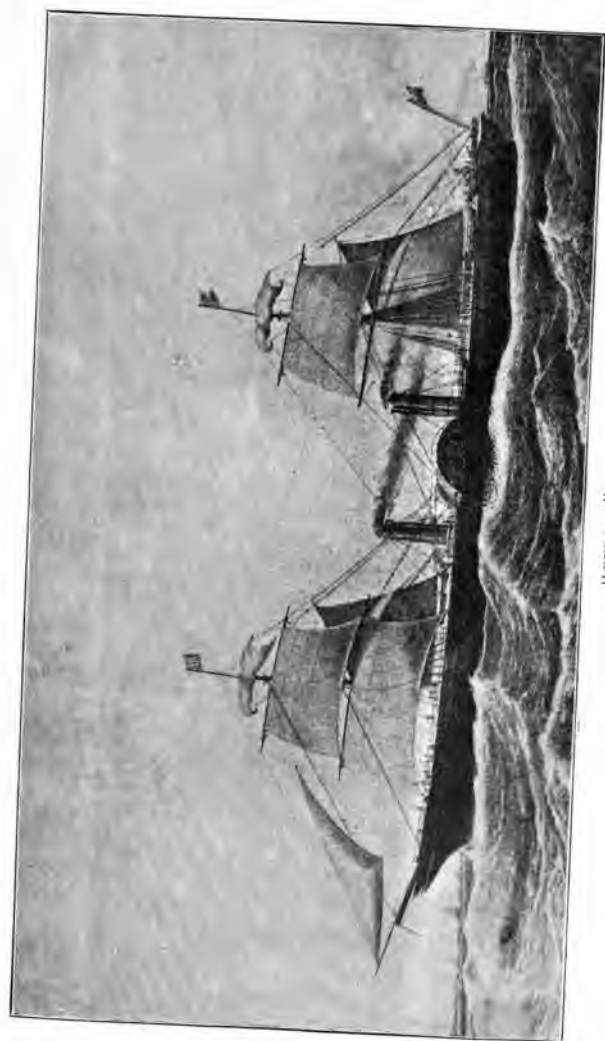
increase the subsidy to \$33,000 per voyage, or \$858,000 per annum, for only twenty-six voyages (which was more than double that paid to the Cunard Company at first), but they demanded increased speed. In 1849 they commenced to run the *Atlantic*, sailing 27th April, and at first they certainly fulfilled the expectations of their most sanguine friends. They slightly exceeded the Cunard boats in speed; they reduced the freight of fine goods from £7 10s. to £4 per ton, and they were generously patronised by Americans, carrying, in 1852, 50 per cent. more passengers to New York and 30 per cent. more to Liverpool than their opponents. The *Arctic's* best run west was 9 days 13 hours from Liverpool, and 9 days 13 hours 30 minutes going east, her maximum speed being 13·3 knots per hour. Extraordinary interest was manifested in the competition on both sides of the Atlantic, and heavy bets were constantly made.

To meet it the Cunards ordered two ships from Robert Steele, the *Africa* and the *Asia*, built of oak and double-planked, and launched in 1850; 266 × 40 × 27·2, 2226 tons gross, 1214 net; engines by Napier, cylinders 96½ inches, with 9 feet stroke, 824 H.P. nominal, consuming 76 tons of coal per day.¹ They were magnificent ships for their day, but, owing either to their models or their boilers, they were not quite as fast as the Collins boats, their best passage west being 10 days 10 hours 50 minutes, and east 10 days.

But the Cunards were not to be vanquished. With indomitable energy they produced ships which were not only superior in speed to the Collins ships, but also in regularity and safety. In 1852 they launched the *Arabia*, built by Steele, also of wood, 285 × 40·8 × 27·2, 2402 tons gross, 1474 net, with engines by Napier of far greater power than any of the previous ships; her cylinders were 103 inches, with 9 feet stroke, 938 H.P. nominal, but 3250 indicated, consuming no less than 120 tons of coal per day.¹ She had very fine lines, and was extremely fast in smooth water, her maximum speed, when light, being 15 knots; but in a head sea she buried herself, and the engines being too powerful for her hull she worked herself to pieces. Eventually she was broken up. Her sister ship, *La Plata*, was sold before she was completed, to replace the burnt *Amazon*, running to the West Indies.

And now at length the Cunards resolved to abandon wood, and ordered from Napier an iron ship of great size and power, which was launched in 1855, and started on her first voyage in January, 1856. This was the celebrated *Persia*, which became a great

¹ John Burns.



"PERSIA."

favourite with passengers and distanced everything. Her dimensions were $376 \times 45 \cdot 3 \times 29 \cdot 9$, 3300 tons gross, 2079 net; cylinders 100 inches, with 10 feet stroke, 917 H.P. nominal, but 4000 indicated, consuming no less than 150 tons of coal per day.¹ But they still adhered to the paddle wheel. She made the western passage in 9 days 21 hours 41 minutes from Liverpool, and the eastern in 9 days 2 hours and 55 minutes, her average speed being 13·95 knots; but the writer has seen her make $16\frac{1}{2}$ when light, and 360 knots in 24 hours. Her average time in 1856 was 24 hours less than the Collins ships.

By a clause in their original contract with the Government, the Cunard Company were bound to construct their vessels of sufficient strength and capacity to act as gunboats if required. Though they were never called upon to fight, in another capacity their services proved of great value during a national emergency. Thus, in 1855, during the Crimean War, eleven of the company's ships were employed as transports. They carried troops, horses, and military stores to the Crimea, and wounded soldiers back to Scutari hospitals, and thus rendered service of inestimable value to the State.

So many of their ships being taken from the mail route the Collins line, for a time, took the Cunard days of sailing alternately, and thus kept up the weekly communication with the United States.

The later history of the Collins ships, however, was a very sad one. While the world was applauding the apparent triumph of America in the great ocean race, Charles McIver wrote to Mr. Cunard: "The Collins Company are pretty much in the situation of finding that breaking our windows with sovereigns, though very fine fun, is too costly to keep up;" and this prediction was soon verified.

On the 27th September, 1854, when 60 miles S.E. of Cape Race, the *Arctic*, Captain Luce, bound to New York with 233 passengers (of whom 150 were first-class) and a crew of 135, was in collision with a small French iron steamship, the *Vesta*, during a dense fog. The *Vesta* was saved by her collision bulkhead, and reached St. John's, Newfoundland. The *Arctic* launched a boat to save the passengers and crew of the *Vesta*, but it was soon found that the *Arctic* herself had received fatal injuries, and in four hours she sank. As it was blowing a gale at the time some of her boats were destroyed in launching; others, which got clear of the sinking ship, were never again heard of, and only two, with 31 of

¹ John Burns.

the crew and 14 passengers, escaped. Among those who perished were the wife of Mr. Collins, their only son, and a daughter. Seventy-two men and four women sought refuge on a raft, hastily constructed, but one by one they were swept away, and at eight o'clock the following morning one human being alone was left, and after retaining his place for a day and a half after all his companions had perished, he was saved by a passing vessel.¹

The writer heard the account of the wreck from Captain Luce, who went down with his ship, but rose to the surface, and was picked up and landed at Quebec. As many of the passengers were wealthy Americans, there was terrible grief throughout the United States over the disaster.

On the 23rd January, 1856, the *Pacific*, Captain Eldridge, left Liverpool with 45 passengers and a crew of 141, running against the new *Persia*, and was never heard of again. She was supposed to have struck an iceberg, as the *Persia* did. Although the Collins Company was virtually bankrupt, they launched the *Adriatic*, superior in size and speed to the other boats,² but as they failed to procure more capital, and Congress, influenced by the jealousy of Boston, Philadelphia, and Baltimore, refused to grant any more assistance, the company finally collapsed in 1858, and the three remaining boats were sold.

The "Vanderbilt."

In 1855 Mr. Cornelius Vanderbilt, of New York, built a large wooden boat of 2936 tons, with a "walking beam" engine, and called her the *Vanderbilt*. She was to "beat everything afloat," but failed to get a subsidy. He ran her and a smaller boat, the *North Star*, for some time to Southampton and Havre, but as the *Persia* beat the former by 13 hours, the old man was so annoyed that he made her a present to the United States Government during the civil war of 1861-5, and she was afterwards a sailing ship, and known as the *Three Brothers*. She is now a coal hulk at Gibraltar.

To return to the Cunards. They were not altogether satisfied with the *Persia*. She proved weak in the bilges, and it cost £40,000 to strengthen them. She was, too, very hard upon coals. So they determined to surpass her on the same lines. Strangely enough, they were still wedded to the paddle wheel long after others had abandoned it for the screw.

¹ 'Annual Register,' 1854, p. 162.

² The *Adriatic* was sold to the Galway Line, and is now a hulk in Africa.



Mr. Hodder, the biographer of Sir George Burns, says, truly enough, "It was the policy of the company that others should experimentalise, and when the novel principle had been proved by indubitable tests, then, and not till then, to introduce it into their next vessel." So, in 1862, they launched the *Scotia*, the finest, fastest, and strongest ship of her day, and the last of the paddles. She was also built and engined by the Napiers, of iron, but had more beam, a wider floor, and finer ends than the *Persia*. Her dimensions were $379 \times 47.8 \times 30.5$, 3871 tons gross, 2125 net; cylinders 100 inches, with 12 feet stroke; 974 H.P. nominal, and 4900 indicated.¹ She consumed 164 tons of coal per day, and made $16\frac{1}{2}$ knots on her trial trip. She reduced the time from New York to Liverpool to 8 days 22 hours, and became a great favourite with passengers. Up to this time they carried no steerage passengers.

In 1859 they arranged to call off Queenstown to land and receive mails, and thus they were often detained six to ten hours when bound west.

Soon after, too, they abandoned Halifax, and all their mail boats ran direct to New York, but they built a smaller and slower line of screw boats to run direct to Boston without subsidy. Among these were the *Andes* and *Alps*, the *Atlas*, 1794 tons and 230 H.P.; *Hecla*, 1784 tons and 230 H.P.; the *Marathon*, 1783 tons and 230 H.P.; *Olympus*, 1793 tons and 230 H.P.² Later on they built for this route the *Aleppo*, 2181 tons and 220 H.P.; the *Malta*, 2132 tons and 280 H.P.; the *Tarifa*, 2089 tons and 280 H.P.; the *Palmyra*, 2043 tons and 260 H.P.; the *Siberia*, 2497 tons and 300 H.P.; the *Samaria*, 2605 tons and 300 H.P.; the *Batavia*, 2553 tons and 450 H.P.; and the *Parthia*, 3166 tons and 450 H.P., some of the smaller ones running occasionally in their Mediterranean line.

They had, however, at last become convinced that the paddle wheel could not successfully compete with the screw, and as it was certain that the Government subsidy would be reduced, they ordered from Napier, for their mail line, the *China*, an iron screw, which was also launched in 1862, and proved a very fine and fast boat. She was $326 \times 40.5 \times 27.7$, 2539 tons gross, 1539 net, with oscillating geared engines; cylinders 80 inches, with $5\frac{1}{2}$ feet stroke, 484 H.P. nominal, and 2250 indicated, burning only one half the quantity of coals (82 tons) consumed by the *Scotia*, with nearly the same speed.³ She settled the fate of the paddle wheel

¹ John Burns.

² The *Hecla*, *Marathon*, *Olympus*, and *Atlas* were afterwards lengthened.

³ John Burns.

for ever, as the screws carried much more cargo, besides steerage passengers. In 1864 they launched the *Cuba*, built by Tod & McGregor, of Glasgow, $338 \times 42 \times 27 \cdot 7$, 2668 tons gross, 1534 net, also with oscillating geared engines; cylinders 82 inches with 6 feet stroke, 520 H.P. nominal, and 2300 indicated, consuming 83 tons of coal per day.¹ She proved a very fine boat. They also bought the *Australasian* from the insolvent "European and Australian Royal Mail Company." She was probably the worst boat they ever owned, for she rolled like a barrel, and her vibration was excessive. They afterwards gave her new engines and boilers, and re-named her the *Calabria*, $338 \cdot 5 \times 42 \cdot 1 \times 36 \cdot 7$, 3321 tons gross, 2031 net, with spar deck.

In 1865 they went to J. & G. Thomson, Clydebank, and launched the *Java*, $337 \times 42 \cdot 6 \times 27 \cdot 7$, with inverted direct-acting cylinders 85 inches, with $3\frac{1}{2}$ feet stroke, 465 H.P. nominal, 2650 indicated, burning 85 tons of coal per day, 2697 tons gross, 1760 net.¹ In 1867 they launched a much faster boat, the *Russia*, also built by Thomsons, $358 \times 42 \cdot 6 \times 28$, 2959 tons gross, 1709 net, cylinders 87 inches, with 4 feet stroke, and although they were only 492 H.P. nominal, they indicated 3100.¹ She was as fast as the *Scotia*, having run from New York to Queenstown in 8 days 20 minutes, and outwards in 8 days 5 hours 52 minutes, consuming only 90 tons of coal per day.

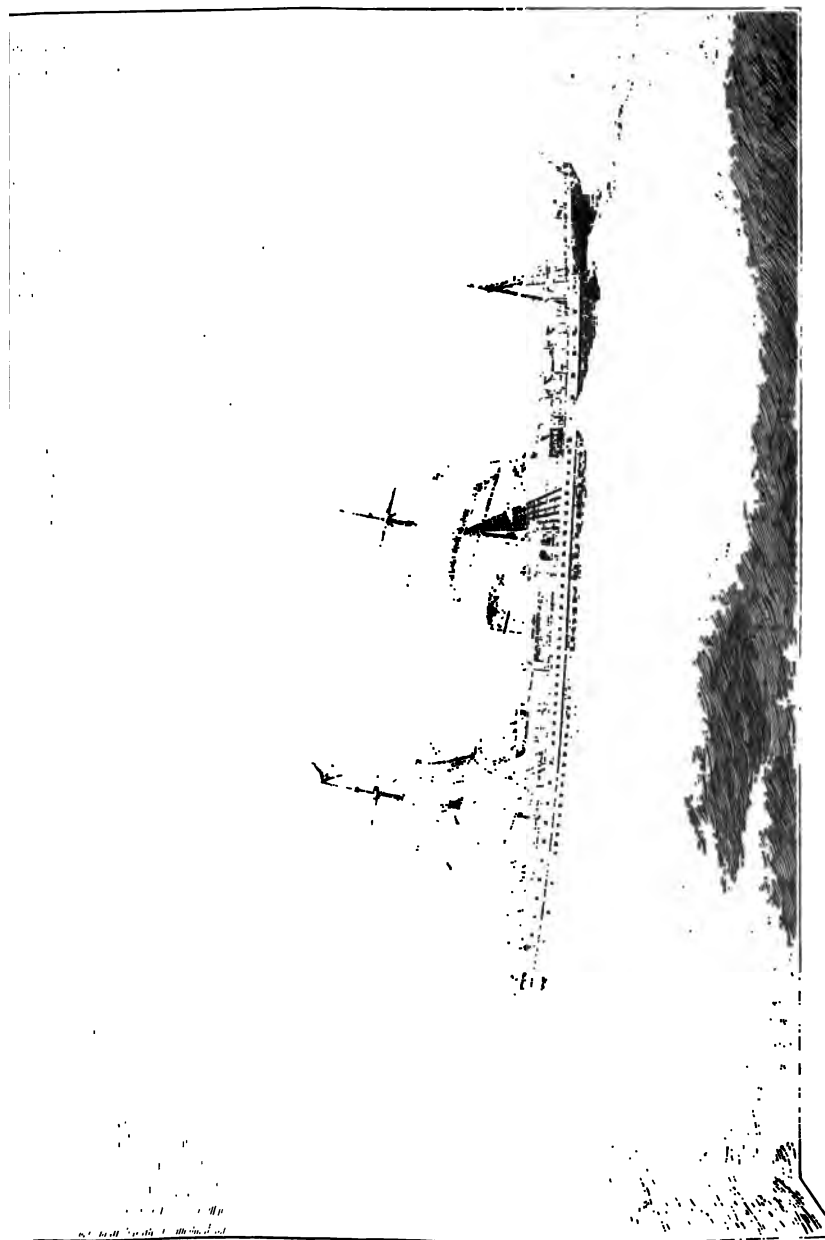
The Queen conferred on Mr. Cunard a baronetcy; and on the 28th April, 1865, he died, aged 78, and was succeeded by his son Edward, the manager in New York. Later on the same honour was conferred on Mr. George Burns.

When their contract expired they had to accept a greatly reduced subsidy, £70,000 a year,² and then made their first great mistake in ordering two boats from Thomsons of inferior power and reduced speed, by which they lost prestige when the competition was unusually severe. These were the *Algeria* and *Abyssinia*, launched in 1870, $363 \times 42 \times 34$, 3253 tons gross, 2076 net. Their cylinders were only 72 inches with 4 feet stroke, 350 H.P. nominal, but 2480 indicated.³ They were completely eclipsed by the Inman and White Star boats. A singular feature of the Cunard management from the first has been their ultra-conservatism. For thirty years they never altered the saloons, the state-rooms, the bill of fare, the meal hours, or any of the details. They had no bath or smoking-rooms, no piano, and only an

¹ John Burns.

² John Burns before Royal Commission of 1874.

³ John Burns.



apology for a lady's cabin. Even the type and form of the original "menu" were preserved. But then during all these years they never lost a passenger or a letter, and this gave them both prestige and profit. Charles McIver deemed both the boats and the management *perfect*, and that was enough. When examined before the "Royal Commission on unseaworthy ships" in 1874, he urged this so strongly that the sarcastic old Duke of Somerset, the chairman, replied, "We are quite ready to admit, sir, that there is only one Charles McIver in the world." He paid no attention to the demand for larger saloons and state-rooms, smoking-rooms, baths, electric bells, water-taps, etc., but his competitors did. In truth, for a time, they seemed to have fallen into the evils inherent in all monopolies; unbroken success made them over-confident, and they now received a rude awakening. The "White Star" boats beat them, not only in speed, but in comfort and convenience, and it became evident that the halcyon days of subsidies were nearly over. But for one melancholy disaster the "White Star" line would probably have retained the lead in the affections of the travelling public, a lead which they afterwards regained by the wonderful performances of their twin-screw ships.

The "Compound" engine had now come into great favour, and the Cunards decided to turn their attention more to freight and steerage passengers than they had hitherto done. So, in 1874, they launched two very fine, large, useful boats, calculated to carry 3000 tons of cargo, 340 saloon, and about 1000 steerage passengers, each with midship saloon and modern improvements. These were the *Bothnia* and *Scythia*, built and engined by J. & G. Thomson. They were very long, $420 \times 42'3 \times 35$, 4556 tons gross, and 2906 net, with compound cylinders 60 and 104 inches, and $4\frac{1}{2}$ feet stroke, consuming only 63 tons of coals per day, or 2'2 lbs. per I.H.P. per hour, but they were only 507 H.P. nominal, and 3250 indicated. Consequently they were about two knots slower than the *Britannic* or *Germanic*, which got the cream of the first-class passenger traffic.

When the Cunard contract expired the Government refused to renew it, and announced a change of policy, despatching at least three mails a week by the boats showing the best monthly record for speed, and paying for the mails by weight, letters at 4s. 6d. per pound, but newspapers and book-packets at very low rates.

In 1879 they had built by Thomsons a magnificent boat, the *Gallia*, of 4819 tons, beautifully fitted to meet the "White Star"

competition. She is $430 \cdot 1 \times 44 \cdot 3 \times 35$, 700 H.P. nominal,¹ and as she averaged about 15 knots, she became very popular. John Burns (the son of Sir George) now announced in a letter to the *London Times* their determination not to be outdone, and that they had contracted for a monster boat of 7500 tons, with a speed of 17 knots. This was the *Servia*, built of steel by Thomsons, and launched in 1881, $515 \times 52 \cdot 3 \times 39 \cdot 9$, 7392 tons gross, and 9900 H.P. indicated, with triple cylinders, one of 72 inches and two of 100 inches diameter, with $6\frac{1}{2}$ feet stroke. She proved very fast, making 16·9 knots on her trial trip, and reducing the time from Queenstown to New York to 6 days 23 hours 50 minutes.

But now two great naval architects had come to the front, and designed ships which almost took one's breath away. These were Edward J. Harland of Belfast, and William Pearce of Glasgow, (the successor of John Elder at Fairfield); both insisted on greater length of hull, high-pressure steam, and triple cylinders. Mr. Harland had designed and built all the "White Star" boats, and Mr. Pearce designed and built for the Guion Company the *Arizona* and *Alaska*, which brought him fame and fortune. The Queen conferred a baronetcy on Mr. Harland in 1885, and a similar honour was bestowed on Mr. Pearce in 1887, and both entered Parliament. The premature death of Mr. Pearce was deeply lamented.

Thomsons, too, maintained their great reputation for unsurpassed workmanship and superb fittings, but Mr. Pearce's ships excelled them in speed. Thomsons built and engined in 1882 the *Aurania* for the Cunards, $470 \times 57 \cdot 3 \times 37 \cdot 6$, 7269 tons gross, and about 9900 I.H.P., as a sister ship to the *Servia*.

The death of Sir Samuel Cunard and his son, Sir Edward, the ill-health of Charles McIver, and the great age of Sir George Burns now induced them to convert the concern into a "limited liability company" (hitherto Burns, McIver, and Cunard had been the sole partners). The stock was eagerly taken up, and John Burns was elected chairman.

The competition was now very severe, and the directors turned to Pearce. He designed and built for them in 1884 the now celebrated *Etruria* and *Umbria*. The former is 8127 tons gross, but only 3690 net; the latter is 8128 and 3699. The dimensions and engines of both are exactly alike—hull $500 \times 57 \cdot 3 \times 39$; engines, 2500 H.P. nominal and 14,500 indicated, with three cylinders, one of 71 inches diameter and two of 105 inches,

¹ 'Mercantile Navy List.'



"GALLIA."

with 6 feet stroke, and working with 110 lbs. steam. Their power and speed were unprecedented, and, for a time, they were the "Queens of the Atlantic," the *Etruria* making the westward record of 6 days 1 hour, and the *Umbria* the eastern of 6 days 1 hour and 15 minutes. The *Etruria* reduced the homeward record to 6 days 4 hours and 58 minutes, leaving New York on July 7th, 1888, average speed 19'51. This passage she has beaten on many occasions, her best homeward run being now 6 days 1 hour, leaving New York on January 5th, 1895, average speed 19'36, and voyage 114.

The *Umbria* broke the homeward record with a passage of 6 days 3 hours 12 minutes, leaving New York November 12th, 1888, average speed 19'20 knots. This she has surpassed on many occasions, her best passage now being 6 days 1 hour 15 minutes, leaving New York on August 13th, 1892, average speed 19'30. The *Etruria* is fitted to carry the enormous number of 650 saloon passengers, and 160 second cabin, besides steerage. Mr. Pearce took the *Batavia* and *Parthia* in exchange, and gave them new engines and boilers. The *Algeria* was sold to the Guion Line, from which she was afterwards transferred to the Red Star Belgian Line, and is now named *Pennland*. Mr. Pearce also built another very fast boat for the Guion Company, the *Oregon*, but the company having got into pecuniary difficulties, the Cunard Company purchased her. She was 7375 tons, 501 × 54'2, with similar engines to the *Etruria*. Her career was short, and her loss was the first really great disaster the Cunards had met with for forty-five years. A wooden schooner struck her near the engine-room at night off Long Island, and made a large rent; the bulkhead shutters moved in grooves, which were filled with small coal, and the shutters could not be closed in time. The fires were extinguished, and the ship sank; but although most of the mails were lost, all the passengers and crew escaped on board the North German Lloyd's steamship *Fulda*, and, to the infinite credit of that company, they refused to accept any remuneration for such a splendid service.

In all these years the Cunard Company had had but three serious accidents. In 1848 the *Europa* sank the emigrant brig *Charles Bartlett* in a fog, when only one man escaped out of 147. In 1858 the *Arabia* and *Europa* met nearly "end on" off Cape Race, the former reaching Halifax, and the latter St. John's, Newfoundland, both damaged, and the *Tarifa* ran ashore on the Tuskar rock (Ireland).

The company also built three fine boats for the Boston route—

the *Catalonia* in 1881, by Thomsons, $429 \times 43 \times 33\cdot8$, 4841 tons, 600 H.P. nominal; and in 1882 the *Pavonia*, also by Thomsons, $430 \times 46 \times 34\cdot9$, 5588 tons, 700 H.P. nominal; and the *Cephalonia*, by Laird of Birkenhead, $430 \times 46\cdot5 \times 34\cdot5$, 5517 tons, 700 H.P. nominal.

The company's capital is £1,600,000 sterling (\$8,000,000). For a time dividends were suspended, but in 1888 the company paid 4 per cent., in 1889 6 per cent., and in 1890 4 per cent., with £280,000 to the credit of the insurance fund, very moderate profits, it must be confessed.

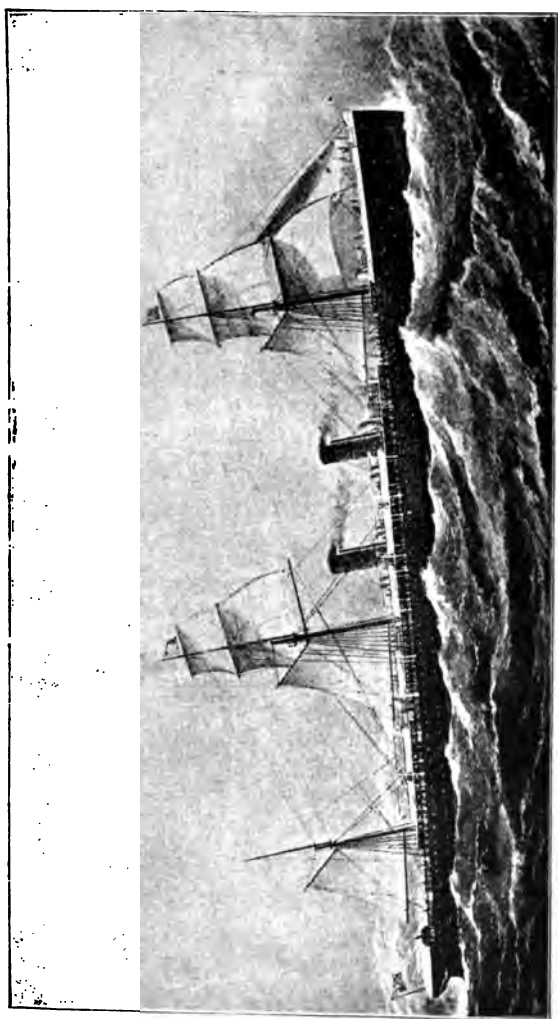
Naval architects were agreed that in the *Etruria* and *Umbria* the single screw had reached its limit, and now came the last and best epoch, "twin screws," the immense advantages of which have already been dwelt upon in the fifth chapter of this work.

Though the *Etruria* and *Umbria* are magnificent ships, they did not long maintain their supremacy. In 1887 the new directors of the "Inman and International Company" decided to build two ships which should "eclipse everything afloat," and accordingly they contracted with Messrs. J. & G. Thomson, of Glasgow, for the *City of New York* and *City of Paris*, and adopted for them "twin screws," driven by two sets of triple-cylinder engines, working up to 18,400 and 20,000 H.P. indicated. The ships were of enormous size, 10,499 tons gross, and superbly fitted in every respect. The *City of New York* commenced running in 1888, and the *City of Paris* in the spring of 1889. Their experience soon demonstrated the immense advantages of the "twin screws," and they at once became favourites with the travelling public.

These were quickly followed by the "White Star" boats *Teutonic* and *Majestic*, which, though not quite as large as the Inman and International boats, were equally fast, being also "twin screws," and the accommodations for passengers equally magnificent.¹

Following their traditional policy, the Cunard Company waited to see the result of these experiments. Their success being beyond question, the company had either to follow suit or run behind in the race. The directors decided on the former course, and in the autumn of 1891 they contracted with the "Fairfield Company" of Glasgow (John Elder & Co.) for two boats of still larger size and greater power, the largest and fastest boats in the world, to be named the *Campania* and *Lucania*, after two great southern

¹ For full description of all four boats, see the chapters on the "Inman Line," and the "White Star Line."



"SERVIA."

provinces in ancient Italy. The *Campania* was launched on the 8th September, 1892, and made her trial trip on the 15th April, 1893. The *Lucania* was launched on the 2nd February, 1893, but did not make her trial trip until August. As these two boats are now universally admitted to be the finest and fastest in the world, it is necessary to describe them in detail. They are both exactly alike in hull, engines, boilers, and passenger accommodation.

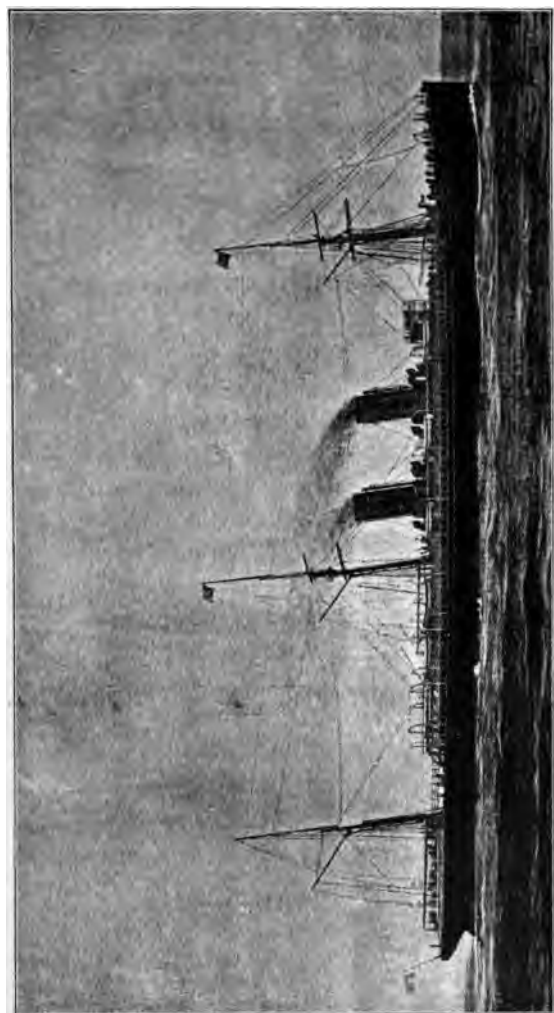
They are 620 feet long, over all, that is, "on deck," with 65·3 feet beam, and 43 feet depth of hull, measuring 12,950 tons gross. Their bottoms are on the cellular principle for water ballast, with minute water-tight sub-divisions. The hulls are built of Siemens-Martin steel, and advantage has been taken of the improved sections of that material to materially increase their strength without adding to their weight. The shell-plating is in 26-foot lengths, and in some instances longer. From the keel to about the water-line, the plates are fitted on the lap-butt principle, which has now generally taken the place of flush end-to-end joints in merchant ships, as being stronger, though less sightly. Sir Edward Harland, in a letter to *The Times*, claims that this system was originally introduced by him in the *Teutonic* and *Majestic*, and that in other respects the *Campania* and *Lucania* are *facsimiles* of the former, "especially in the method of supporting the twin-screw shafts in the 'run' without the aid of the usual brackets, as well as in the facility with which the propellers, if found too small, may be increased in diameter by overlapping them in the manner found so advantageous in the *Majestic* and *Teutonic*, as being not only snugger when docking, but less apt to race in a heavy sea."

The Cunard boats, however, have an aperture in the stern frame, similar to that in a single-screw ship, in order that the screws may work freely, although they are fitted close to the centre-line of the ship. The upper, main, lower, and orlop decks are of steel sheathed with wood.

The engine-rooms are divided by a longitudinal bulkhead, but in the other parts of the ships cross bulkheads have been adopted throughout, the builders fearing that a continuous longitudinal centre-line bulkhead might, by the flooding of a large compartment on one side after a collision, give the ship so heavy a list as to risk a catastrophe such as happened to H.M.S. *Victoria*. The *Campania* and *Lucania* are divided into eighteen compartments, those forward, where the risk from collision is greatest, being shortened in length. In case any two of these compartments, and

in many cases even three, were flooded with water, the ship would still be perfectly safe. These bulkheads rise from the keel to the main deck, and are strengthened by deep bars of channel section instead of by angle irons. Where openings are pierced in them the doors can all be closed from the deck by a common rack-and-pinion arrangement with a certainty that cannot be gainsaid. As the ships were built as armed cruisers for service when required by the Admiralty, they have, among other provisions, water-tight coal-bunkers at the side of and over the top of the boiler compartments, forming a protection against the modern quick-firing guns. The ships' lines are so fine that they have only capacity for 1620 tons of cargo and 3200 tons of coal each. They have straight stems and elliptic sterns, top-gallant forecastles and poops. Above the "upper" deck are two tiers of deck-houses, surmounted respectively by the "promenade" and "shade" decks. A "constitutional" of a mile can be procured by making the circuit of the promenade deck four times.

The engines are estimated to indicate 15,000 H.P. each, 30,000 in all. Each engine has five cylinders and three cranks. The two high-pressure cylinders are 37 inches in diameter, the intermediate is 79 inches, and the two low-pressure 98 inches, with a stroke of 5 feet 9 inches. They are arranged tandem fashion, with a high-pressure cylinder over a low-pressure one at each end, and the intermediate in the centre. At 81 revolutions (their normal speed) this enormous weight is moved about 2000 feet per minute. The crank shaft is 26 inches in diameter, and each of the three interchangeable parts weighs 27 tons. These, with the thrust shaft, 14 feet long, make up a total weight of 110 tons for each crank shaft. The propeller shaft is 24 inches in diameter, fitted in lengths of 24 feet, each length having two bearings. The screws, which are placed on the ends of the shafts without any exterior over-hanging bracket, are three bladed, and each blade weighs 8 tons, made of phosphor-bronze. A great novelty in the machinery consists in the addition of what is described as an "emergency governor." In the event of the fracture of the propelling shaft, or upon anything occurring which would result in the "racing" of the screw beyond, say, 130 revolutions per minute, the governor will act upon the reversing gear, place the eccentric links into mid-gear, and thus stop the engines and prevent such an accident as befell the *City of Paris*. It has been found so effective after severe tests, that the engineers confidently leave it to take care of itself. The machinery is most ingenious in its arrangements, and wonderfully simple in its action.



"ETRURIA."



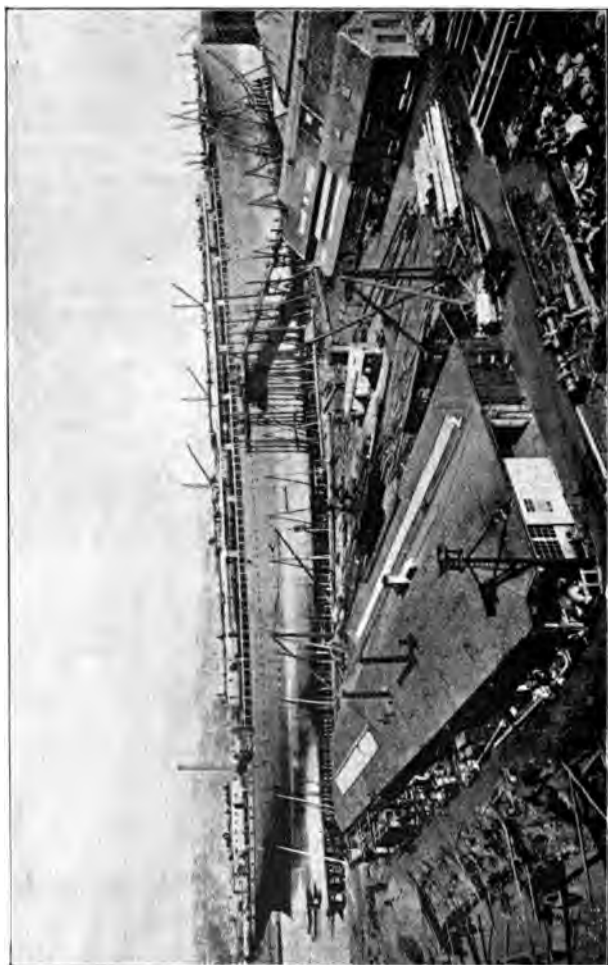
These gigantic engines are started and reversed by steam ; a cylinder in which a piston and rod by one stroke handles the links through which the machinery is put in motion. Their height from the base to the top of the cylinders is no less than 47 feet. Steam is supplied to the engines by 12 cylindrical boilers, 18 × 17 feet, with four furnaces at each end, and made to sustain a pressure of 165 lbs. to the square inch, tested to double that pressure. They are placed longitudinally, three in a row of two groups, in separate water-tight compartments divided from each other by a coal-bunker the full width of the ship and 65 feet in length. There are also two other boilers, intended chiefly for the auxiliary engines, 18 × 11 and 10 × 10 feet respectively. The two funnels are each 19 feet in diameter, with a double skin, so as to maintain a strong draught of air, and their tops are 130 feet above the floor of the ship ! The rudder is one large plate of steel, 22 × 11½ feet in area and 1½ inches thick, rolled by Krupp. It has arms on either side and is strengthened by webs on the top and bottom. It weighs, with the steering gear, 45 tons. Connected with the rudder is a novel and most ingenious steam-steering apparatus devised by Messrs. Brown, which dispenses with the whole of the chains and connecting rods, and puts an end to the noises. The auxiliary arrangements in view of any derangement of the main-steering gear are admirable, and effectually provide for the safety of the ship. There is no wheel, and it is so constructed that it can be applied to the rudder within a minute. To guard against even the failure of the latter arrangement a pair of powerful hydraulic rams are provided with sufficient power to steer the ship. In the event of the ship being employed as a warship, and both the main and auxiliary gear being injured by an enemy's shot, they are supplied in addition with a steering station below the water-line connected by telegraph with the bridge. The vast importance of all this will be seen when it is remembered that even the *Great Eastern* was rendered helpless by a damaged rudder, rolled like a log, and had to return to Queenstown.

The bridge is built of steel, is placed immediately before the forward funnel, and is 60 feet above sea-level. On it a double set of instruments has been provided for directing the whole staff during the watch, and also a telegraphic communication between it and both engine-rooms. From it the quartermaster can control the steering gear by hydraulic power. There are also telegraphs to the steam capstan and deck machinery. There are only two light pole masts and no yards. The "crow's nest," or look-out, is on the foremast, 100 feet above the sea-level, but it is within easy

hailing distance from the bridge, and the men can command a radius of fifteen miles. The anchors weigh $8\frac{1}{2}$ tons each. The total weight of anchors and cables is 120 tons, worked by a steam capstan and other appliances with as much ease as if they weighed only as many pounds. The crew numbers no less than 424 persons in all, of whom 54 navigate the ship, 190 manipulate the engines and boilers, and 180 are in the steward's department. The whole ship is lighted by 1300 ten-candle power incandescent lights. There are four sets of generating plant, each set consisting of a Siemens dynamo, coupled direct to a Belliss engine running at the rate of 280 revolutions a minute. There are also 8 large reflectors of 8 lights each for working cargo, and a powerful search-light for facilitating navigation at night. In all there are no less than 40 miles of wire. Refrigerating arrangements will produce 12 tons of ice per day. In a ship designed to carry over 2000 souls, ventilation is a matter of prime importance, and in these ships it is very perfect throughout; by the use of Utley's patent ventilators fresh air is admitted to all the state-rooms and saloons, while the sea is excluded.

The accommodations for passengers are sumptuous. Each ship is designed to carry 600 first-class, 400 second-class, and 700 to 1000 third-class passengers. The dining saloon is a vast, lofty apartment, near the middle of the ship, 100 feet long, 62 feet broad, and 10 feet high, capable of seating at dinner 430 passengers in revolving armchairs. The decorations are highly artistic: the ceiling is panelled in white and gold; the sides in Spanish mahogany; and the upholstery is in a dark, rich red figured frieze velvet, with curtains to match. There are nooks and corners where small parties may dine in complete seclusion. The 40 side lights are of unusual size; fresh air is admitted by the patent ventilators in the roughest weather, and the outlet is by oval ventilating shafts through the roof. For lighting as well as for ventilation there is a central well, 24×16 feet, carried up from the saloon to above the awning deck, where it is covered by a curved dome of stained glass. The drawing-room is a splendid apartment, 60×30 feet. The walls are in satinwood, relieved with cedar mouldings; the ceiling is in pine, decorated in light tones, in which old ivory and gilding prevail. The settees, ottomans, and chairs are upholstered in rich velvets and brocades, which, with a Persian carpet, brass firegrate, and hearth of Persian tiles, form a superb *tout ensemble*. A grand piano and an American organ are also provided.

The library is 29×24 feet. The roof is very ornate, with



"CAMPANIA" ON THE STOCKS.

electric lamps in each of the alternate panels. The columns supporting it are covered with Mecca and blue velvet. The walls are finished in richly carved mahogany, with Amboyne panels. Writing tables and chairs are arranged around them, and a handsome bookcase is filled with a choice library of books.

The smoking-room is 40 × 32 feet. Its decorations are in the old Scottish baronial style, with chairs and tables to match.

The state-rooms are lofty and well ventilated. The old wooden coffin-like berth has been superseded by Hopkins' "triptic" beds, which are so constructed that the upper bed folds up against the bulkhead. The lee board is movable, and being only one-half the length of the bed can be fixed at either end or in the middle. There are rooms suited to all tastes; single and double berth cabins and family rooms. For those who do not mind the cost, there are suites of rooms fitted in satinwood and mahogany, with everything to match; parlour and bedroom, the former fitted up with tables and chairs after the style of a lady's boudoir; the latter fitted with a brass bedstead, hangings, wardrobe, etc. There are also state-rooms fitted with a collapsible bedstead, or with one capable of being extended so as to form a double bed, and which, when used as a single one, may be converted into a couch and settee.

The rooms for second-class passengers are all placed abaft the machinery. The dining-saloon is on the upper deck, and handsomely furnished. The drawing-room is on the promenade deck, nicely decorated, and provided with a cottage piano. The smoking-room is in the poop, and is finished in American walnut. The state-rooms are far above the old style, a large number however, having four berths.

The steerage is on the lower deck, and is fitted with iron portable berths. Its passengers are allowed to promenade on the upper-deck, which is about 450 feet long.

Such is a fair description of these two noble ships—literally floating palaces—which cross the Atlantic in 5½ days or less almost with the speed and regularity of a railway train. What a contrast to the little *Britannia* of 1840, 207 feet long, 1139 tons gross, 740 H.P. indicated, with accommodation for 90 passengers, and an average speed of 8·3 knots! And what a monument to the skill of British shipbuilders and the enterprise of British ship-owners!

And now for their performances:—The *Campania*, on the measured mile, attained a maximum speed of 27 miles an hour. Leaving Liverpool on her maiden voyage on Saturday the 22nd, and Queenstown on the 23rd April, 1893, and proceeding under

easy steam, she reached Sandy Hook on Saturday the 29th, and crossed the bar at 5.24 P.M., 6 days 8 hours and 34 minutes from Queenstown, the fastest maiden passage on record. Her best day's run was 503 knots, and the average speed per hour 18.78 knots for the voyage, the total distance run being 2865 knots. The *Majestic* previously held the maiden voyage record—6 days 10 hours 30 minutes. Returning, she left New York on Saturday the 6th May and arrived at Queenstown on Friday the 12th at 9.30 A.M. in 5 days 17 hours and 27 minutes, the best eastward passage then made by any steamer. The previous record was 5 days 19 hours 57 minutes, held by the *City of New York*. During this trip she made the extraordinary run of 517 knots, going east, in about 23 hours 10 minutes (actual time), equal to 553 knots going west. Total distance run 2899 knots. In June she made the western trip in 5 days 15 hours and 37 minutes (2864 knots), her average speed being 21.11 and her best day's run 548 knots. In September she made the run east in 5 days 14 hours and 55 minutes, and in October the western passage in 5 days 13 hours and 23 minutes (2786 knots), and on four successive days made 517, 524, 523, and 533 knots. On her return trip east she made the run in 5 days 12 hours and 7 minutes (2812 knots, and average speed 21.28). In 1894 she beat both records; in August she made the western run in 5 days 9 hours and 29 minutes, landing her passengers on the wharf at New York on Friday night (2783 knots, and average speed 21.49). On five successive days she made 516, 528, 543, 525, and 545 knots, and the return trip east was made in 5 days 10 hours and 47 minutes (2814 knots, and the average speed 21.52).

Wonderful as are these performances the *Lucania* has done even better. She started from Liverpool on her maiden trip on Saturday the 2nd September, 1893, and from Queenstown on the 3rd, and reached Sandy Hook in 5 days 15 hours and 37 minutes, by far the fastest maiden passage ever made, and beating the *Campania's* by no less than 16 hours and 48 minutes; but on her return trip she was detained by fog during 31 hours, yet made the run in 5 days 17 hours and 21 minutes, her best day's work being 514 knots. In October, on her second trip west, she made the run in 5 days 13 hours and 45 minutes, beating the best run ever made previously (by the *City of Paris*—5 days 14 hours 24 minutes). On this passage the *Lucania* made the phenomenal run in one day of 560 knots, equal to 23.33 per hour, a run which has never been equalled before or since. In October, on her third voyage, she broke her own and all records by making the outward passage in



"CAMPANIA'S" SALOON.

5 days 12 hours 47 minutes—distance, 2780 knots; speed 20'93. In May, 1894, she made the western passage in 5 days 12 hours and 57 minutes by the southern or longer route, the distance being 2873 knots, and the average speed 21'90; and though her return trip east occupied 5 days 12 hours and 59 minutes, she made the extraordinary run of 526 knots in 23 hours 10 minutes (actual time), equal to 564 knots going west. On the 31st August she reached Sandy Hook by the northern route (2787 knots) in 5 days 8 hours and 38 minutes, the average speed being 21'67, and by a singular coincidence her return trip east was made in the same time to a minute (2810 knots), the average being 21'84. In September she did it in still less time, making the western run in 5 days 7 hours and 48 minutes, the distance being 2782 knots, and the average speed 21'77. But in October she capped the climax, and reached Sandy Hook in 5 days 7 hours and 23 minutes, the distance being 2779 knots, and the average speed 21'81, thus proving herself beyond all question the fastest ship in the world.¹

Up to this time, January, 1895, these splendid ships have met with no accident, but two of the company's other ships have not fared so well. On June 7th, 1893, the *Servia* ran into and sank the American ship *A. McCallum*, bound from London to New York, but rescued all the crew save one man. On December 18th, 1893, the *Umbria* left Queenstown for New York, and as she had not arrived on the 29th, great anxiety was felt for her safety. It afterwards appeared that on Friday, the 23rd, a fracture was discovered in her shaft, and her machinery was stopped. After drifting for 12 hours in a storm she was towed 75 miles by the Hamburg steamship *Bohemia*, but the cable broke and the ships lost sight of each other in about 57° West Long. While drifting for three days Mr. Tomlinson, the chief engineer, succeeded in performing one of the most difficult feats ever attempted at sea. He repaired and strengthened the fracture in three days, so that the great ship proceeded at half speed, and arrived safely at New York on the 31st without further assistance. Considering that the engine is capable of exerting 14,000 H.P., and that the ship was all the time rolling in a heavy sea, the feat reflects the highest credit on his skill, energy, and perseverance, and he richly deserved his reward.

As these fast boats now run from Liverpool to Queenstown in about 10 hours, and the mail train occupied about 16 hours from

¹ In 1895, however (May 18-24), she made the eastern passage (2897 knots) in 5 days 11 hours and 41 minutes, the average speed being 22'01 knots per hour!

London to Queenstown, the boats had to wait at the latter port some 5 or 6 hours for the mails. The company, finding that the competition of Southampton was telling against them, owing to its proximity to London, and the trains running alongside the ships at the docks, gave notice of their intention to cease calling at Queenstown.

The Postmaster-General, however, has arranged for a special train to leave London at 4.10 P.M., reaching Queenstown at 7 A.M., thus avoiding all detention of the ships, and enabling the *Campania* and *Lucania* to land their passenger and mails on Friday, which, except on rare occasions, cannot now be done. The company has also arranged to convey passengers to and from the railway to the ships free of charge, and have induced the London and North Western Railway Company to build a branch from their main line to the pier-head. The Mersey Docks and Harbour Board have, too, deepened the bar at the entrance of the Mersey, and propose to build a new landing-stage, alongside which the largest steamships can land their passengers at any state of tide.¹ Unless specially addressed *via* Southampton the mails are forwarded twice a week from Liverpool and Queenstown; Saturdays by the Cunard Line and Wednesdays by the White Star Line. Their quantity is ever increasing. In early days 150 sacks was about the average; now they average fully 1500, and the *Majestic* recently carried 1672. In 1893-4 the British Post Office paid £105,500 sterling for carriage of mails to New York, of which the Cunard Line probably received at least a moiety. The United States Post Office has made a contract with the International Navigation Company (Inman and Red Star Lines) for the carriage of mails to Southampton, for which it is to give a heavy subsidy—\$4 a mile, or about \$750,000 a year. This contract comes into operation the latter end of 1895. At present it pays a very low rate to foreign boats, 44 cents per lb. letters and postcards, and 4½ cents per lb. for other articles, against \$1.60 and 8 cents respectively to American boats. Under this arrangement the Cunard Company received from the United States Post Office last year the sum of \$129,900, equal to about £26,000 sterling.

The *Campania* and *Lucania* are paid a retaining fee by the British Admiralty, and the company hold the *Etruria*, *Umbria*, *Aurania*, and *Servia* at the disposal of the Admiralty without a retainer.

The competition, both for passengers and freight, is now so

¹ See Appendix No. 12.



"CAMPANTIA'S" LIBRARY.

severe that it is doubtful if any of the lines are paying more than running expenses. The last report of the Cunard Company shows that, notwithstanding its great prestige and the magnificence of the service, it did not make any profit in 1893. All it could do was to pay 2 per cent. out of its underwriting account. (See Report.)

The history of this company has been dwelt upon at length, because it was not only one of the pioneers in Atlantic steam navigation, but because that history is absolutely without a parallel in the history of the world. Of no other company can it be said that in fifty-three years it has never lost the life of a passenger ; that for forty-four years it never lost a letter ; and that in about eight thousand trips, amid hurricanes, fogs, ice, and icebergs, on a very dangerous route, only two ships have been lost ! What is the secret ? It is idle to talk of luck. " Luck's a fool ; pluck's a hero, and wins the race," said President Porter, of Yale. " The chapter of accidents is the Bible of fools," says the *London Times*. All we know is, that three determined, able men set themselves to accomplish a certain end, and that, aided by Divine Providence, they succeeded. Two or three things, however, stand out, showing the means they used.

First.—To any one who, like the writer, was in the habit of sailing in these ships, it was evident from the first that some one at the head of the company was an excellent judge of character. This was seen in the captains, engineers, and officers, and even in the stewards. Never was discipline more perfect, or order more complete. Such men as Judkins, Lott, Leitch, Harrison, Shannon, Stone, Lang, Moodie, Anderson, Cook, Grace, and McMicken were the very *crème de la crème* of the British mercantile service. Brave, bold, watchful, cautious, and stern, they were also, with perhaps one or two exceptions, accomplished gentlemen. Judkins took the *Persia* up the St. Lawrence with troops late in December, 1861, through ice and snow, and landed them at Bic, for which he was made an honorary lieutenant in Her Majesty's Navy. Lott was given a public banquet in New York on the completion of his 500th trip after only one serious accident. Harrison and Anderson were both, in turn, selected to command the *Great Eastern*. The latter was knighted by the Queen for laying the Atlantic cable, but poor Harrison, after braving Atlantic storms, was " drowned in a ditch " at Southampton by the upsetting of a boat. Grace went to the National Line and became commodore. After standing on the bridge of the *America* for forty-eight successive hours in a winter's gale, he retired to his cabin to die—a hero.

Nor were the chief engineers any less distinguished. Caldwell,

Wilson, and Waddell, among many others, long served the company with marked ability and success. And what a contrast the stewards were to those in many other lines ! Always polite, attentive, and patient, there was nothing a reasonable man could ask that they would not do for him.

Secondly.—They always chose the very best men to build their ships and engines, and spared no expense. Napier as an engineer, and Steele as a shipbuilder, were long unrivalled, and much of the company's success was certainly due to them.

Thirdly.—*Punctuality* was always a marked feature of the management, and justly very highly prized. The ships sailed not only to the day and the hour, but to *the minute*. How often has the writer seen the captain mount the bridge at 11.30 A.M. ; at 11.45 give the order " In gangways " ; at 11.55 ring the engine-room bell, and as the ship's bell was striking twelve o'clock the engines would move ahead. At sea, in all weathers, everything went like a well-regulated machine. Before " eight bells " were all struck the lunch or dinner bell was heard ; and for many years the British public looked for their American and Canadian letters on Monday morning as regularly as those by an express train.

Fourthly.—The rule was always enforced to sacrifice *speed* to *safety*, and never to run any avoidable risk. Even now, though newspapers often speak of " racing " and " making a record," it is believed that the Cunard ships are never allowed to practise either.

Lastly.—The Cunards have always been noted for their liberality to their servants. If they demanded good service and strict obedience, they paid good wages. All honour to such men ! They shed lustre upon the British name, and make the British flag respected throughout the world. Charles McIver retired from the company in 1882, and died at Malta in 1885, aged seventy-four. Sir George Burns only died in 1890, at the patriarchal age of ninety-five. A board of directors, with Sir John Burns, son of Sir George, as chairman, and Mr. William Cunard, a younger son of Sir Samuel, now carry on the work.

THE CUNARD FLEET.

No.	Name of Ship.	Tons.	I.H.P.
1	Lucania	12,950	30,000
2	Campania	12,950	30,000
3	Umbria	8,127	14,500
4	Etruria	8,128	14,500
5	Servia	7,392	10,000
6	Aurania	7,269	9,500
7	Pavonia	5,587	4,000
8	Cephalonia	5,517	4,000
9	Catalonia	4,841	3,200
10	Gallia	4,809	5,300
11	Scythia	4,557	3,115
12	Bothnia	4,535	3,160
13	Samaria	2,605	1,530
14	Marathon	2,403	1,500
15	Atlas	2,396	1,500
16	Aleppo	2,181	1,255
17	Saragossa	2,166	950
18	Malta	2,132	1,360
19	Tarifa	2,089	1,260
20	Palmyra	2,043	1,250
21	Demerara	1,904	900
22	Trinidad	1,899	900
23	Kedar	1,876	960
24	Morocco	1,855	960
25	Cherbourg	1,614	803
26	Nantes	1,473	650
27	British Queen	772	430
28	Skirmisher (tender)	607	800
29	Otter do.	287	150
30	Jackal do.	180	200
31	Monkey (barge)	167	..
32	Badger do.	165	..
33	Swan do.	165	..
34	Satellite (tender)	157	200
35	Squirrel (barge)	140	..
		117,938	148,833

CUNARD STEAMSHIP COMPANY.

Report for the year 1893, dated March 17th, 1894.

The profits for the year, including £4296 os. 11d. brought forward from 1892, amount to £200,090 18s. 5d., and after debiting income tax and providing £154,419 3s. 9d. for depreciation of ships and wharf properties, and £36,965 14s. 1d. for the company's insurance fund, there remains to the credit of profit and loss account £5867 15s. 3d. This credit has been increased by a transfer of £30,000 from the insurance fund, to £35,867 15s. 3d., and out of this amount the directors recommend the payment of £32,000 as dividend, being at the rate of 2 per cent. per annum, free of income tax (payable on and after April 2nd), carrying forward the balance, £3867 15s. 3d., to the credit of profit and loss account for the year 1894. The balance at the credit of insurance fund, after making the above-mentioned transfer, has been increased by £4500, and now stands at £322,000.

Trade during 1893 continued unprofitable and disappointing. Owing to various causes the first-class passenger business between the United States and Europe was smaller than it has been for a number of years, the second-class business alone showing an increase. Freights generally were very unremunerative.

The coal strike increased for a time the company's working expenses, but the regular sailings were maintained without a break, though at some inconvenience.

The new ships *Campania* and *Lucania* were delivered in April and August respectively, and made several voyages between Liverpool and New York. Their reputation for speed and comfort is already established, and the directors anticipate that they will prove popular and profitable ships.

To increase the efficacy of the fleet for freight purposes, the company have ordered two twin-screw steel steamships, of about 6000 tons each, from the London and Glasgow Engineering and Iron Shipbuilding Company, Limited, Glasgow, which are to be delivered at the end of 1894 and the beginning of 1895 respectively.

As the Mersey Dock Board require the site of the company's works at the Huskisson Dock for dock extension purposes, the company are erecting new works in a convenient position, which will probably be completed early next year.

The various services of the company have been carried on with efficiency, and the vessels and machinery maintained in excellent order. (See Appendix No. 1.)

THE CUNARD STEAMSHIP COMPANY, LIMITED.

ACCOUNTS FOR THE YEAR ENDING 31ST DECEMBER, 1893.

<i>Dr.</i>	<i>Revenue Account.</i>		<i>Cr.</i>	
	<i>Expenditure.</i>	<i>Income.</i>		
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
To working expenses: coal, wages, provisions, ship and engine stores, port and general charges, &c. . . .	853,325 8 5	By freights, passage money, postages, &c. . . .	1,199,067 4 6	
" office and agency expenses . . .	53,086 13 4	" freights, passage money, through charges repaid by the company . . .	£223,221 14 9	
" charitable subscriptions and donations . . .	309 15 8			
" law expenses	857 1 8			
" directors' fees	2,190 8 3			
" auditors' fees	210 0 0			
	909,979 7 4			
To repairs and renewals of fleet . . .	82,476 10 9			
" insurance paid	35,883 15 1			
" profit and loss account, balance . .	170,727 11 4			
	£1,199,067 4 6			£1,199,067 4 6

<i>Profit and Loss Account.</i>				<i>Cr.</i>	
<i>Dr.</i>				<i>£</i>	<i>s. d.</i>
To income tax . . . . .	.	.	.	2,838	5 4
„ depreciation on ships . . . . .	.	.	.	152,879	2 5
„ ditto on wharves, &c. . . . .	.	.	.	1,540	1 4
„ insurance fund . . . . .	.	.	.	36,965	14 1
„ balance carried down . . . . .	.	.	.	5,867	15 3
				<u>£200,090</u>	<u>18 5</u>
By balance from 1892					
„ revenue account, balance					
„ interest					
„ sundry receipts					
				<u>£200,090</u>	<u>18 5</u>
By balance brought down					
„ transfer from insurance fund					
				<u>£35,867</u>	<u>15 3</u>
<i>Insurance Fund.</i>				<i>Cr.</i>	
<i>Dr.</i>				<i>£</i>	<i>s. d.</i>
To dividend, proposed 2 per cent. on paid-up capital of £1,600,000 . . . . .	.	.	.	32,000	0 0
„ Balance to 1894 . . . . .	.	.	.	3,867	15 3
				<u>£35,867</u>	<u>15 3</u>
By balance from 1892					
„ profit and loss account					
				<u>£35,867</u>	<u>15 3</u>
<i>Reserve Fund.</i>				<i>Cr.</i>	
<i>Dr.</i>				<i>£</i>	<i>s. d.</i>
To average claims, &c. . . . .	.	.	.	2,465	14 1
„ transferred to profit and loss account . . . . .	.	.	.	30,000	0 0
„ balance . . . . .	.	.	.	322,000	0 0
				<u>£354,465</u>	<u>14 1</u>
By balance from 1892					
				<u>£354,465</u>	<u>14 1</u>

CHAPTER VIII.

THE INMAN LINE.

THE Inman Line comes next after the Cunard in order of time.

William Inman was a native of Leicester, England, born in 1825, and became a clerk in the office of Richardson Brothers, Liverpool. In January, 1849, he became a partner, and had the entire management of a fleet of sailing packets trading between Liverpool and Philadelphia. He thus gained an intimate knowledge of the emigrant business. He was a man of great energy, and universally respected.

Although the *Great Britain*, the first ocean screw steamship, had been a marked success, few had as yet much faith in the screw. One of the few was the late David Tod, of the firm of Tod & McGregor, of Glasgow, shipbuilders and engineers. In 1850 he decided to try the experiment of running iron screws to New York with goods and steerage passengers, and launched the *City of Glasgow*. She was 1610 tons gross, 227 feet long and 32 feet beam, with 350 H.P. nominal. This was really the commencement of the third "Epoch," and led to great results.

Mr. Inman watched her progress with great interest, and after a few successful trips he persuaded his partners to buy her and run her to Philadelphia. She sailed from Liverpool under her new owners, commanded by B. R. Matthews, formerly of the *Great Western*, on the 11th December, 1850. Mr. Inman formed the "Liverpool, New York, and Philadelphia Steamship Company," and as he became the general manager it was better known as the "Inman Line." She was successful, and Mr. and Mrs. Inman made a trip across the Atlantic specially to study the wants and discomforts of steerage emigrants. In 1851, a larger ship, the *City of Manchester*, was added. She was also built by Tod & McGregor, as were most of the company's subsequent ships. She was 274 × 38, 2125 tons gross and 400 H.P. nominal. She

was so successful that she is said to have left a profit of 40 per cent. on her first year's work.

The line soon became specially popular with emigrants, and it carried more third-class passengers than any other. In 1857 the line was transferred to New York, and in the two years 1856-7 the company carried no less than 85,000 passengers! Between 1851 and 1856 they added the *City of Philadelphia*, 2189 tons; the *City of Baltimore*, 2538 tons; the *City of Washington*, and the *Kangaroo*, all iron screws, and in 1857 they commenced calling at Queenstown. This great success quickly led to the formation of many other lines of screw steamships to the United States and Canada.

In 1856 no less than three new lines were established, the "Allan," the "Anchor," and the "Hamburg-American"; in 1857 the "North German Lloyds," and in 1859 the "Galway" line. Except the last-named all were successful, and all went to the Clyde for their ships.

The owners of the American sailing packets fought hard for the emigrant business, but at last realised that the struggle was hopeless, and gradually sold their ships to British, Norwegian, Canadian, and German shipowners. But it was not until 1874 that they finally ceased to carry emigrants. Americans could not build iron screws as cheaply as the British, and their antiquated navigation laws forbade their shipowners to buy British-built vessels.

In 1860 the Inman Company increased their service to once a week; in 1863 to three times a fortnight; and in 1866 to twice a week in summer. After the collapse of the "Collins" line in 1858 they assumed the latter's days of sailing and carried the United States mails; and when the Cunard line gave up the Halifax route the Inman Company made a contract to carry the mails to and from that port, and did so for many years until the Allans secured it. To carry out these services the company built many fine ships, all in the Clyde. The *City of Bristol*, 2655 tons, 350 H.P.; the *City of Boston*, and the *City of New York*. In 1863 the *City of Limerick*, 2536 tons and 250 H.P.; and the *City of London*, 2765 tons, and 450 H.P. In 1865 they bought the *Delaware* and re-named her the *City of New York*, 3499 tons and 350 H.P. (the second of that name). In 1866 they built the *City of Paris*, 3081 tons (346 × 40 × 26) and of much greater power, 550 nominal. In 1867 the *City of Antwerp*, 2391 tons and 350 H.P.; and in 1869 the *City of Brooklyn*, 2911 tons and 450 H.P.; and the *City of Brussels*, 3747 tons (390 × 40 × 27) and 600 H.P. In 1872 they ventured on

larger ships and built the *City of Montreal*, 4451 tons and 600 H.P.

The *City of Paris* was their fastest boat, and in 1869 she made the passage from Queenstown to Halifax in 6 days 21 hours, up to that time the quickest on record between the two ports. In 1870 the company carried 3635 saloon and 40,635 steerage passengers to New York, more steerage than any other line. The Cunard Company carried 7638 saloon, but only 16,871 steerage. But during these years the company did not fare as well as the Cunard Company in freedom from accidents. Indeed, they suffered many grievous disasters, but their courage never failed. The *City of Glasgow*, after several years' successful work, left Liverpool for



"CITY OF LONDON."

New York, 1st March, 1854, with 480 persons on board, and was never heard of again. The *City of Philadelphia* was wrecked near Cape Race, and the first *City of New York* on Daunt's Rock, near Queenstown, but without loss of life. Then the *City of Boston* left Halifax with many Nova Scotians on board, and disappeared for ever, probably through striking ice or an iceberg. The *City of Brussels* broke her main shaft in mid-ocean, and thousands were kept in painful suspense for weeks, and afterwards sank off Liverpool Sands after collision with another ship. Subsequently the *City of Montreal* was burnt at sea, but no lives were lost, and more than one of the other ships broke their main shafts.

By 1872 the competition of the "White Star" line began to tell

on the Inman Company, as on all other lines, severely, and to meet it they launched, in 1873, two magnificent ships with spar decks. Their engines were compound, with cylinders 76 and



Chas. Inman

120 inches in diameter, and 5 feet stroke. Their speed on the trial trip was 16 knots. These were the *City of Chester*, 444 × 44 × 34'6, 4770 tons, built by Caird & Co., of Greenock, and the *City of Richmond*, 440 × 43'5 × 34, 4780 tons, by Tod &

McGregor. The latter ran from Sandy Hook to Fastnet Rock in 1873 in 7 days 23 hours, and her first seven voyages to Queenstown averaged only 8 days 11 hours and 58 minutes.

But Mr. Inman was not yet satisfied. In 1875 Caird & Co. built for the company the *City of Berlin*, the longest ship then afloat (except the *Great Eastern*), and, for a short time, the fastest. Her length on deck is 520 feet, beam 44'2, depth to spar deck 34'9, 5526 tons gross, with compound engines; cylinders 72 and 120 inches in diameter with $5\frac{1}{2}$ feet stroke, 900 H.P. nominal, but indicating 4799, with accommodation for 202 first and 1500 second and third class passengers. She reduced the time to Queenstown to 7 days 15 hours 28 minutes, and 7 days 18 hours 2 minutes going west.

Then to meet the competition of the *Servia* and other crack boats, they contracted with the Barrow Company to build a monster ship, and called her the *City of Rome*, 8144 tons gross, $560 \times 52 \times 37$, with six cylinders, three of 46 and three of 86 inches in diameter, the engines indicating no less than 11,890 H.P. She made 18'23 knots on her trial trip, and was magnificently fitted; but after several trips she failed to reach the guaranteed speed for lack of boiler power, and the company threw her up. She passed into the hands of the Anchor Company, and was replaced by a boat building on the Clyde for the Dominion line, the *City of Chicago*, 5202 tons, $430 \times 45 \times 33'6$, and 900 H.P. nominal. This was the last boat Mr. Inman had built. He died soon afterwards deeply lamented, as did also Mr. Dale, long the New York agent of the company.

Some American capitalists, interested in one of the great railways, now determined to take hold of the company, and bought a "controlling interest" in it. They could not put the ships under the United States flag, but they took advantage of a singular technical judicial decision in England to run them under the British flag. British law does not permit an alien to own any interest in a British ship, but when, in 1846, the collector of customs at Liverpool refused to register a new ship, the *Equador*, for the Pacific Company, because some of the shareholders were aliens, the company appealed to the Court of Queen's Bench, which decided that for purposes of registry "an English incorporated company is a British subject, notwithstanding that some of its shareholders may be foreigners." This was rather humiliating to the great American nation, but they could not then compete successfully with British built ships.

The new directors now decided to "eclipse everything afloat"



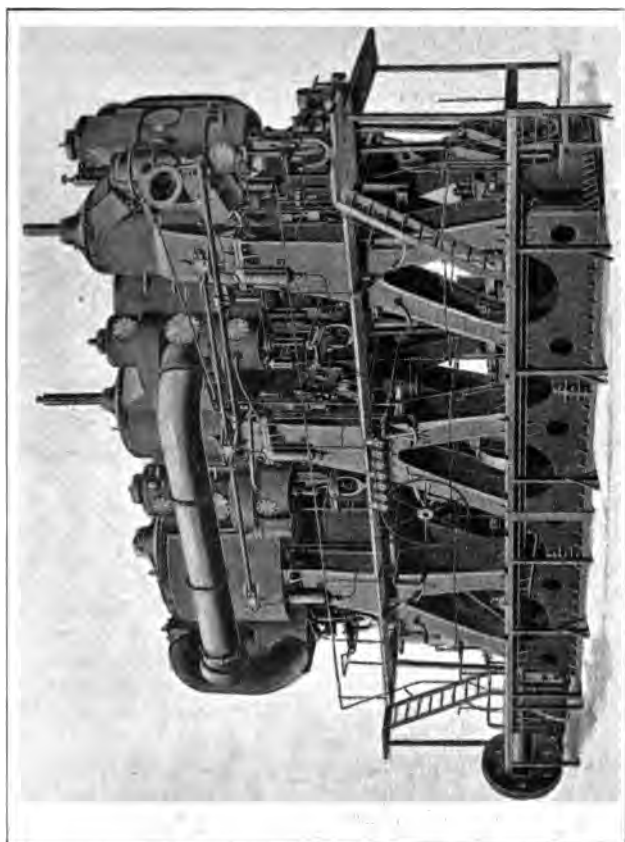
"PARIS."

with two ships to be built by J. & G. Thomson, of Glasgow,¹ and it must be admitted that they succeeded. They boldly adopted "twin screws," and the ships inaugurated the sixth, and last, and best "Epoch" in Atlantic steam navigation. They were named the *City of New York* and *City of Paris*, and are 527 feet long "between perpendiculars," 565 feet "on deck," 63 feet beam, and 39 feet deep, and measure 10,499 tons gross. They have two independent sets of triple expansion engines each, with cylinders 45, 71, and 113 inches in diameter, and 5 feet stroke; with forced draught the engines of the *City of New York* indicate 18,400 H.P., and on her trial trip she made 20'13 knots; but for some reason, which even the builders cannot explain, the engines of the *City of Paris* indicated 20,100 H.P., and on her trial trip she made 21'952 knots per hour, being far in excess of the guaranteed speed. There are nine boilers in each ship, working at a pressure of 150 lbs. to the square inch.² The hulls are of a very beautiful yacht-like model with handsome "cut-waters" and figure-heads, certainly much more graceful than the straight stem now so much in vogue. Each ship has 15 water-tight compartments separated by strong transverse bulkheads, the two sets of engines being also separated by a longitudinal bulkhead, the great advantages of which have been pointed out in a previous chapter. These bulkheads rise up from the keelson to the saloon deck, or 18 feet above the load water-line, and are said to have no openings of any kind. The buoyancy thus secured is so great that even were three of the compartments filled with water the ship would not sink. Practically, therefore, she may be considered as unsinkable. The screws are supported by massive steel brackets. The rudders are of an entirely new description, designed by Mr. J. R. Thomson and Professor J. H. Biles, and are controlled by novel steering-gear invented by Mr. A. B. Brown of Edinburgh. Two hydraulic rams are used, one on each side of the tiller, and the pressure is controlled by the quarter-master on the bridge, which is said to secure greater accuracy in steering than when the wheel is used. There are three funnels, but only light pole masts, without yards, which greatly reduce the resistance of head winds, and thus add to the speed of the ship. The ships are lighted throughout by electricity. The dynamos being of extra power, they generate a current powerful enough, not only to light up the whole ship, but also to rotate the fans employed in ventilating her, and thus 250,000 cubic

¹ Designed by Professor Biles, of the University of Glasgow.

² Consuming about 330 tons coal per day, or 1'71 lbs. per I.H.P. per hour.

feet can be drawn off from each compartment per hour. Each ship can accommodate 540 first and 200 second class passengers, besides steerage, but carry little cargo. The tendency, in these days of luxury, is more and more towards separating passengers



TRIPLE-CYLINDER ENGINE.

and cargo ; the former demanding a high rate of speed, and the latter large capacity with very economical engines and moderate speed.

So much for speed and safety. But these beautiful ships have

other attractions. Under the contract with the builders, they were not only to be so constructed as to prevent them sinking under any circumstances which human foresight could provide against, but their accommodations for first-class passengers were stipulated to combine "the comforts of home with the richest luxuries of hotel life," and most faithfully has the contract been carried out.

Those who, like the writer, have been in the habit of crossing the Atlantic twice a year for a quarter of a century will appreciate them fully; but others may now be only anticipating their first sea trip. In the early Cunard ships the little "state-rooms" so amusingly described by Dickens in his 'American Notes,' as "this utterly impracticable, thoroughly hopeless, and profoundly preposterous box, on board the *Britannia*," were only six feet square; they contained two narrow bunks, like coffins, two wash basins and jugs (the latter having a knack of pouring their contents over the lower bed), two little mirrors, two brass pegs, and a little seat, or "perch," as Dickens calls it. Of ventilation there was practically none, except on very fine days, when the stewards were allowed to open the "side ports." The peregrinations of one's portmanteaus, the gyrations of one's hat, and the swinging of garments on the pegs were maddening, especially to those suffering from sea-sickness; no hot water or boots could be had, nor even your light extinguished, without bawling for "steward" perhaps a dozen times, when the reply would be heard in the distance, "What number, sir?" (A wag on board the *Canada* once changed all the boots late at night, and the scene in the morning was indescribable.) If you wanted a smoke you had to go to a wretched little place over the boilers called the "fiddle," where the stokers were hoisting the ashes, and where you often got soused with salt water. There were a few books, and very good ones too, but they were kept under lock and key, and a special application was necessary to get one. There was no piano, or organ, or bath-room; the only promenade was on the top of the deck-house, only 60 feet long, and at meals you often had to climb over the backs of long benches to get to your seat. The "Allan" boats had larger saloons and a better promenade, but the former were right aft, where the "racing" of the screw was often extremely disagreeable, and the motion of the ship excessive. In both there was only an apology for a "ladies' cabin."

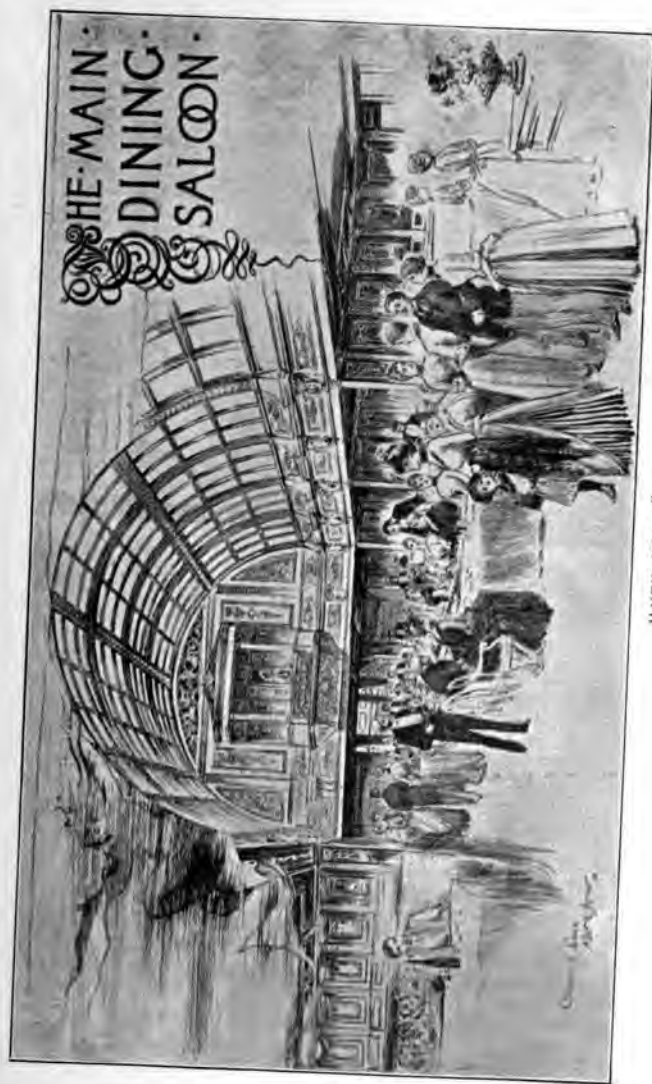
Now mark the striking contrast in the "Inman and International Company's" ships, the name of the new company. The accommodation throughout is superb. The state-rooms are large, lofty, and well ventilated by fans and patent ventilators, which always admit

fresh air, but exclude the sea. There are single and double beds which can be closed by day, as in a Pullman car, converting your room into a cosy little sitting-room. Instead of the rattling, noisy water jugs, you turn a tap and get a supply of hot or cold water ; you touch a button, and your steward instantly appears without a word being spoken. Neat wardrobes enable you to banish your portmanteaus or trunks to the baggage-room ; you turn a switch and you get an electric light ; and if you want a nap or wish to retire early, you can turn it off in a moment. If you have plenty of spare cash, and are willing to part with some of it, there are forty rooms on the promenade and saloon decks, arranged in fourteen suites. Each suite comprises a bedroom, with a brass bedstead, wardrobe, etc., a sitting-room, with sofa, easy-chair, and table, a private lavatory and, in most cases, a private bath. Here you can entertain your friends, or enjoy a game in privacy. You can have the luxury of a morning bath and a promenade some 400 feet long.

To diminish sea-sickness, you dine in a saloon near the middle of the ship, beautifully decorated with naiads, dolphins, tritons, and mermaids, lofty and bright. The arched roof is of glass 53 feet by 25 feet, and its height from the floor of the saloon to its crown is 20 feet. Besides the long dining tables in the centre there are a number of small ones placed in alcoves on both sides for the use of families or parties of friends ; revolving arm-chairs replace the benches, and electric lights the candlesticks with their lashings. If you enjoy a cigar or a pipe, a luxurious smoking-room, 45 feet long, is provided ; its walls and ceiling are panelled in black walnut, and its couches and chairs are covered with scarlet leather. There is an elegant "drawing-room" beautifully decorated and luxuriously furnished. The "library" with its 900 volumes is lined with oak wainscoting, with the names of distinguished authors carved on it in scrolls, and its stained glass windows inscribed with quotations from poems referring to the sea. The kitchen is isolated in a steel shell, the odours from which are carried off by ventilating shafts into the funnels.

The second cabin passengers are placed in the after-part of the ship, where they have a dining-room, smoking-room, piano, &c. The steerage passengers are also well provided for, having no less than 300,000 cubic feet of space.

Provision too is made for divine service on the Sabbath day ; at each end of the saloon there is an oriel window built under the glass dome over the dining-saloon. The casement of one of these serves for a pulpit. The opposite one contains an organ, and



"NEW YORK."

many famous organists and vocalists have taken part in the services as well as in musical entertainments given on week days for charitable objects.

In truth, the ships were fitted with a luxury and magnificence unequalled at the time, and are said to have cost two million dollars each.



"CITY OF NEW YORK" TWIN SCREWS.

The *City of New York* commenced running in 1888, and the *City of Paris* in the spring of 1889. The Paris Exhibition of 1889 gave them a splendid business, and neither suffered from lack of attention on the part of the United States press or the Telegraph Companies.

The *City of New York* was somewhat of a disappointment at first as to speed, owing to a defective air pump, but ultimately she

made a record of 5 days 19 hours and 57 minutes, from Sandy Hook to Queenstown (2814 knots), being the first to do it under six days. The *City of Paris* from the first proved herself to be a faster boat than her sister ship. In August, 1889, she made a record from Queenstown to Sandy Hook of 5 days 19 hours and 18 minutes (2788 knots). This she gradually reduced until, in October, 1892, she did it in 5 days 14 hours and 24 minutes (2782 knots); and this was not only the fastest passage ever made up to that time, but it continued so until beaten by the *Lucania* in October, 1893. The *City of Paris* made 530 knots on her best passage, and for a time was justly hailed as the "Queen of the Atlantic."

While it is unquestionably true that "twin screws" not only add to the safety of a ship, but give her also immunity from serious detention when she meets with any ordinary accident, many experienced nautical men are of opinion that the increased speed of steamships necessarily means increased risk; and the experience of these two noble ships certainly tends to confirm this opinion, so far as their machinery is concerned. The *Persia's* engines never made over 17 revolutions per minute; those of the *City of Paris* make 89, and the length and weight of the latter's shaft are far greater than the *Persia's*. There is, of course, force in the argument that there must be less risk in a $5\frac{1}{2}$ days' passage than in one of 10 days; Captain Judkins, the first commodore of the Cunard line, even argued that it was safer to go full speed in a fog than half speed, because you are "sooner out of it," but few will now agree with him. The strain, however, on such massive machinery as is now used has proved in several instances more than it can bear. Thus, the *City of New York* broke a crank pin going east, which disabled one of her engines, yet she made no less than 382 knots in less than 24 hours with the other, a most conclusive proof of the value of "twin screws." The *City of Paris* has been still more unfortunate in this respect. On the 25th March, 1890, when going east with about 1000 passengers, she met with a most extraordinary accident, such as may not happen again in a century. The immediate cause was the breaking of her starboard main shaft near the screw when making 80 revolutions per minute. This, of course, caused the engine to "race." A connecting rod, 11 inches in diameter, broke, and, acting like a huge flail, smashed the two standards (weighing 14 tons each), and the low-pressure cylinder (weighing 45 tons) broke off the condenser pipe, and made a hole in the after bulkhead, thus flooding the engine-room. All this would not have stopped her, or

imperilled her safety, had not flying pieces of metal made three ragged holes in the longitudinal bulkhead, thus causing both engine-rooms to be flooded, and driving all the engineers on deck. The forward bulkheads, protecting the boilers, remained intact and kept the ship afloat ; she was towed to Queenstown by the *Aldershot* (s.s.), the condenser and injection pipes were plugged and the water pumped out, when she proceeded to Liverpool with her port engine, unassisted. On docking her the "lignum-vitæ" bushing of the after bearing was found to be worn away ; the end of the shaft had dropped seven inches and been fractured. There has always been a difficulty in lubricating the after bearing of the shafts of screw steamships, and to overcome it, the late John Penn, of Greenwich, invented the "lignum-vitæ" bearing, which produced a natural lubrication, and is now in general use. It was this lignum-vitæ which had worn away in such an extraordinary fashion.

The fact remains that the *City of Paris* escaped under circumstances in which, according to the official report of the Board of Trade in London, "no ordinary vessel could have remained afloat after such an accident."¹ The captain and officers were exonerated from all blame.

But the ship's troubles did not end here, for it was her lot to demonstrate later on the immense advantage of "twin screws" under different circumstances. On the 12th February, 1894, when bound west, her rudder became disabled, and it was found necessary to put back. With the aid of her two screws alone she steamed a straight course back to Queenstown, 786 miles distant, in a little over three days ! A single screw might have drifted, helpless, for a month or until picked up and towed back by another steamship. She returned to Liverpool, and while in dock a fire did considerable damage to her second cabin.

The new company has had other troubles to contend with. On the 1st July, 1892, the *City of Chicago* ran ashore in a fog near Kinsale (Ireland), and became a total wreck, but no lives were lost. An official inquiry was held by the Board of Trade, which resulted in the captain's certificate being suspended for nine months ; and in June, 1894, the *City of New York* was in collision with the *Delano* near Nantucket. The former received no damage, but the latter was seriously damaged, though she reached Baltimore in safety.

In the summer of 1894 some little excitement was created in the

¹ The damage to the engine was frightful, and the repairs occupied thirteen months ! £7500 salvage was paid to the *Aldershot*.

newspapers and in the British House of Commons, by a sensational statement of a passenger that the *Majestic* and *Paris* had been racing side by side, and that the *Paris* had crossed the bows of the *Majestic* so close as to compel the latter to slow down. It appeared, however, by the statement of both captains that there had really been no racing, and that the *Majestic* slowed in order to pass under the stern of the *Paris*—a very proper manœuvre.

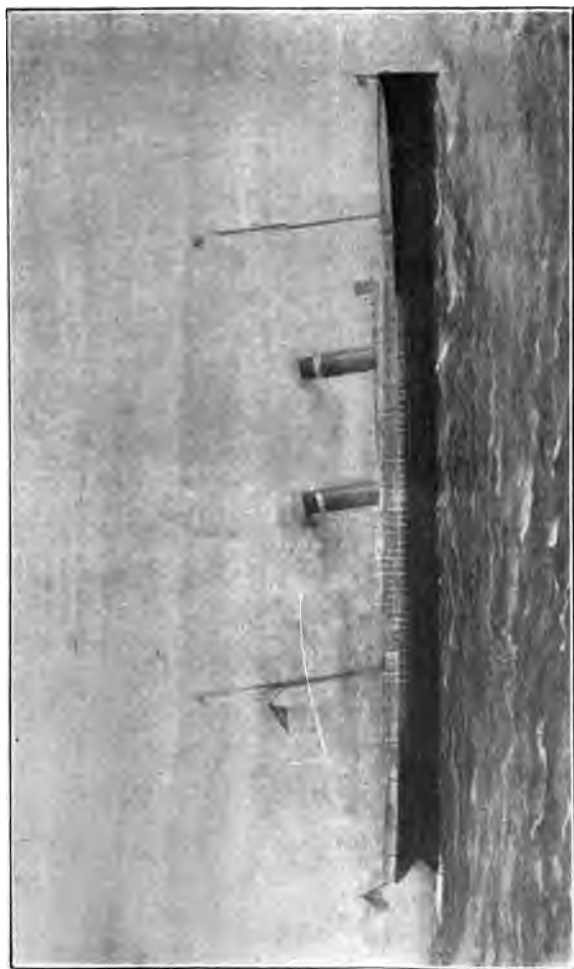
Americans had become so proud of the performances of the *City of Paris* (although British built), that Congress was asked to pass a special Act repealing the very stringent navigation laws in favour of her and her sister ship, and admitting them to United States registry. This was done on condition that the company (now styled "The International Navigation Company") should build an equal amount of tonnage in United States yards of the highest type, at a cost of about four million dollars. So far back as 1865 the present writer had urged the repeal of these navigation laws upon Americans at the Detroit Convention, for the benefit of American shipowners, as well as an act of justice to Great Britain and Canada, both of which have admitted United States built vessels to British Registry since 1849 upon a promise of Mr. Bancroft, the United States minister at London, that his Government would reciprocate.

The new Act would probably have been inoperative but for a second Act, which authorised the Postmaster-General to subsidise large and fast steamships for the carriage of United States mails.

In October, 1892, a contract was entered into to carry the United States mails once a week from New York to Southampton for a subsidy of \$4 per mile; and as the distance is over 3050 knots, the subsidy will amount to about \$750,000 a year, a much higher rate than the British Government ever paid. The rates of freight for goods having become entirely unremunerative, and the frequent detentions at Queenstown and the Mersey bar being a serious drawback, the company now made arrangements to run to Southampton in lieu of Liverpool, and to cater especially for first-class passenger traffic.

Southampton is within two hours of London, and is very near to Havre; it also has splendid wet docks into which the ships can enter and leave at any hour, and where the trains can run alongside the ship, a great convenience to passengers.

By February, 1893, the President of the Company, Clement A. Griscom, Esq., had obtained the consent of the British Government to release the ships from their engagements to serve as armed cruisers, and on the 22nd the United States flag was



"ST. LOUIS."

hoisted on the *City of New York* with great ceremony, both ships being re-christened, one as the *Paris*, the other as the *New York*.

Under United States laws the captains of United States ships must be native-born or naturalised Americans.

Captain Frederick Watkins, of the *Paris*, being a British subject, was consequently disqualified; but in order to retain the command of his splendid ship, he renounced his allegiance to Queen Victoria and became an American citizen, resuming his command in September, 1894.

To carry out the contract with the United States Post Office the Company at once contracted with Messrs. Cramp, of Philadelphia, for two magnificent steel ships of 11,000 tons, to be named the *St. Louis* and *St. Paul*. The former was launched on the 12th November, 1894, in the presence of President Cleveland and a distinguished party.

With such a liberal subsidy, and with the certainty of a preference from American passengers there would seem to be a long era of prosperity in view for this powerful company. The following description of the two new ships has been furnished by the company :—

Description of the Steamship St. Louis, as she will appear when finished.

The ss. *St. Louis*, which is the first of the two vessels being built for the American Line by The William Cramp & Sons' Ship and Engine Building Company, is the first large trans-Atlantic steamer that has been built in this country since the four American boats, *Pennsylvania*, *Indiana*, *Ohio* and *Illinois*, which were built in the early seventies, and which are now running in the American Line between Philadelphia and Liverpool.

The first frames of the *St. Louis* were raised on the 27th day of July, 1893, taking fifteen months and sixteen days from the beginning of her construction to the time of her launch, during which time something over 6000 tons of steel has been worked into her hull, while the construction of her boilers and machinery has kept equal pace in the engineering department, and they are now ready to be erected on board.

It is worthy of note that these steamships are built of domestic material throughout. They are of American model and design, American material, and they are being built by American skill and muscle.

The principal dimensions and qualities are as follows :—

Length over all	554 feet
Length between perpendiculars	535 "
Breadth, extreme	63 "
Depth moulded	42 "
Number of decks	5 "
Number of W.-T. compartments formed by transverse bulk-heads and flats	17 "
Distance of collision bulkhead abaft of stem	33 "
Displacement at 26 feet draught will be nearly	16,000 tons

The *St. Louis* has two funnels, two masts and a straight stem, and the hull is carried out aft around the stern tubes forming webs, so to speak, on either side. The shell plating is lap-buttcd, and the rudder is of the single-plate type. The vessel is so divided by bulkheads that any two, and in some cases three, compartments may be filled with water at the same time without endangering the safe flotation of the ship.

The material used in the construction of this vessel is mild steel of the best quality, and the records of its inspection show an average considerably above Lloyd's standard.

Although the *St. Louis* is not yet in a sufficiently forward condition to enable one on board to get much of an idea of the internal arrangements, the plans are completed, and the comforts and conveniences provided for the passengers are known. Thus the quarters assigned to the different classes of ocean travellers are clearly defined.

The steamship has five decks. On the upper deck, or as the company calls it the saloon deck, is a deck-house extending fore and aft with a passageway 7 feet wide on each side of it between it and the rail on which the traffic of the ship is conducted. The passenger enters this deck-house at several places, but the principal entrance is just forward the foremost funnel, where a spacious staircase arises to the promenade deck, which is on top of this main-deck house, and descends to the first cabin sleeping cabins on the two decks beneath.

In the hallway surrounding this staircase are the rooms of the purser and chief steward, easily accessible to passengers.

The forward end of this hall opens into the library. This is probably the largest reading-room afloat ; and is handsomely fitted up in oak, and furnished with book-cases, writing-tables, comfortable seats, and a plentiful supply of books selected from standard literature, for the use of passengers.

The forward end of this deck, or fore-castle, is occupied by the crew quarters, steerage bar, hospitals, messrooms, etc.

The after end of the hall opens direct into the grand dining-saloon, which is thus situated nearly amidships, between the funnels and on the upper deck of the ship, which is a deck higher than is the case in any large trans-Atlantic steamer, excepting the *New York* and *Paris*, and three of the other steamers of this company. This room is handsomely decorated, and finished in white mahogany, which gives it a very cheerful, bright appearance. It is 110 feet long by 50 feet wide, and will seat all the first-cabin passengers at one sitting. It is well lighted from the sides and above from a large dome, in one end of which is an organ, played from a keyboard placed in one end of the saloon. In addition to the saloon being situated amidships, where the motion of the vessel is least appreciable, the tables are arranged in a fore and aft direction, which obviates the discomfort of side motions when the ship is rolling. There is also a companionway on the promenade deck into the lobby at the after end of the saloon, so that if a passenger desires, he can enter from this end.

The pantries on this ship are not easy for a passenger to find, as he does not have to pass and repass them in going to and from his meals, as is often the case. This will be a great comfort to passengers who are inclined to be sea-sick. As a matter of fact, they are situated immediately abaft the saloon, so that the passengers can be promptly and efficiently served.

Abaft the pantries, and between the engine-room skylights, is situated the engineers' mess-room, and abaft this again, but in communication with the

first-cabin pantry is the second-cabin pantry which is at the forward end of the second cabin dining-saloon. This room is very large and well lighted. It will accommodate about 200 passengers. The tables are arranged in a fore and aft direction ; and chairs instead of the usual settees are provided.

Abaft this is situated the doctor's office and dispensary, where it will be accessible to all passengers.

In the after end of the ship is situated crew quarters, steerage, lavatories, hospitals, etc., etc.

In a house by itself, a very modern feature of the ship, is situated the mail sorting-room and mail clerks' rooms. It is well known that this ship is under contract with the Government to carry the trans-Atlantic United States mail, and everything is most conveniently arranged for this purpose. The mail-room is situated in the after hold, and is reached by a special hatch for this use only. The mail sorting-room is fitted up as is usually the case in post offices on land, and the mail will be sorted there while in transit.

Returning to the main companionway, you ascend to the deck above, or promenade deck, which is continuous from one end of the ship to the other, and on this unbroken stretch of deck, passengers can walk, sheltered almost the whole length from the sun and rain by an awning deck, carried out to the sides of the ship. It is on this deck that passengers spend most of their time during the day.

In the forward end of the house on this deck, immediately forward the grand staircase are six suites of rooms, comprising bed-room, bath-room and sitting-room, furnished in the very best manner possible. They are all reached from the inside of the house, so that it will not be necessary for a passenger to go outside to reach the saloon, or other rooms on this deck.

Directly abaft the main companionway, and opening into it, is the drawing-room, fitted in white and gold, and furnished most luxuriously with comfortable lounges, seats, a piano, and a keyboard by which the organ in the dome can be played.

Abaft the drawing-room on the promenade deck, are situated groups of suites of rooms, containing bath, etc., and deck cabins, all accessible from the inside of the house from either forward or aft. Baths are also provided on the promenade deck convenient to all the deck cabins.

Abaft of this group of rooms, and forward of the engine-room skylights, is a spacious companionway leading down to the after end of the saloon and the sleeping-decks, which can be used if desired instead of the main companionway forward.

Between the engine casings is situated the deck pantry, from which passengers on this deck can be promptly and well served on deck, if they are not feeling well enough to go to the regular meals in the main dining-saloon. This pantry is in direct communication, by a lift, with the main pantry on the deck below, and with the kitchen on the deck below the pantry.

Next to this is the barber's shop, which is of course perfectly appointed.

The rest of the space between the engine casings is taken up by ample lavatories and water-closets for the accommodation of the passengers on this deck. These, as well as all other lavatories and water-closets throughout the ship, are fitted up with the most modern sanitary appliances, of the most approved plan.

Abaft this, at the after end of the first-cabin promenade, is situated the first-

cabin smoking-room in a separate house. It is a very large and well-ventilated room, fitted up in mahogany. The seats and tables are arranged in a very convenient manner to meet the requirements of a smoking-room. The seating capacity of the room is nearly 100. Attached to the smoking-room is a bar, so that passengers can be quickly and efficiently served.

Abaft the smoking-room is situated the second-cabin ladies'-room and the second-cabin companionway; and abaft this again in a house by itself is situated a large and well-appointed second-cabin smoking-room.

Returning to the saloon-deck, and from there descending through the main companionway to the next deck below, one comes to the upper deck, or the first sleeping deck occupied entirely by passengers. The first-cabin rooms are situated amidships; the second-cabin rooms immediately abaft the machinery space; the steerages forward and aft of these; and the crew quarters forward and aft of the steerages. The next deck, or main deck, is devoted to the same purpose, and divided up in the same way. The state-rooms on these decks will be found to be larger than usual, and very well lighted and ventilated. They are fitted up in the most convenient manner; and the beds will be found unequalled for comfort, and are all six feet six inches long. There are an unusual large number of baths and water-closets for the accommodation of the passengers on these decks.

The second-cabin state-rooms are lighted and ventilated similarly to the first-cabin rooms, and all berths and fittings are essentially first class. Special care has been taken to make the second cabin in all respects desirable.

The *St. Louis* has accommodations for 320 first-class passengers, 200 second-class, and about 800 steerage.

The steerages are without doubt unexcelled on the Atlantic. They are lighted and heated by the same process as is used for the first- and second-cabin compartments. The berths are metallic with spring bottoms; and nearly all the steerages are fitted up in rooms. Tables and seats are provided in each compartment; and the pantries being on the steerage deck, ensures promptness in serving the food. The steerage lavatories and water-closets are of the most approved design.

Special care has been exercised throughout the ship to have the sanitary and drainage systems the most complete, and on the latest principles in every respect.

The hospitals are well placed at both ends of the ship, isolated from all passenger compartments, and fitted up in the most approved manner.

Particular attention has been paid to the very important question of ventilation and heating of this ship, and it is believed that the system adopted, which extends to every compartment in the ship, is the most perfect in existence. The air is exhausted from every room and compartment by aid of fans situated in several places on the ship, and fresh air drawn from the outside of the ship will be forced through every compartment, and in cold weather this air will be heated. By this means the entire air in the ship can be changed every ten minutes, and each passenger can control the temperature of his room.

The ship will be lighted throughout with electricity, over 1200 lights being used for the purpose. They are supplied with electricity by four dynamos capable of supplying nearly 3000 lights of 16-candle power each. Electric call bells are also fitted in all rooms.

The stores are carried in a compartment entirely set aside for the purpose,

and a refrigerating plant of large capacity enables perishable stores to be carried at a low temperature.

It is well known that the principal source of danger to ships in the event of a collision is that, as usually divided, they may be struck at the fastening edge of a bulkhead, and the two compartments adjacent to the bulkhead may be thus at the same time completely flooded. Many ships have been divided by bulkheads in such a way that if one compartment were flooded, the ship would be perfectly seaworthy; but in the case of an accident where the ship was struck on the bulkhead and the two compartments adjacent flooded, she would inevitably sink. In the case of these new American line ships, and their sisters the *New York* and *Paris*, however, the subdivision is such that the ship would remain perfectly seaworthy with any two, and in some cases three, compartments flooded. This unbroken subdivision of the ships has an incidental advantage in making them fire-proof, as the spread of the fire is confined to one compartment. Notwithstanding that these ships are practically unsinkable, they are provided with complete boat accommodations for every soul on board, there being 14 life boats, 14 Chambers' collapsible life boats, 1 cutter, 1 gig, and 4 metal life boats, all secured to and operated from the shade deck. The means of rapidly lowering every boat has also received special attention. In these ways as well as in many others has the safety, which should always be the first consideration in a passenger ship, been provided for.

To guard against such a breakdown of machinery as would disable these steamers, they are fitted with two sets of engines, each set driving a separate screw. The engines are in two separate water-tight compartments; and the boilers are in separate compartments, completely cut off from each other, so that the vessels might in collision be struck on any bulkhead, and could have a breakdown of their machinery, such as may occur to any ordinary ship, and still be quite navigable, and thoroughly safe and seaworthy. While, therefore, the vessels are well provided against the effects of collision, they are also very much better able to avoid collision by having two sets of machinery, one of which could be readily reversed while the other was going ahead, thus turning the vessel in her own length.

The law, under which these steamers are built, stipulates, among other things, that they may be taken and used by the United States as transports or cruisers, and that they shall be of sufficient strength and stability to carry and sustain the working and operation of at least four six-inch rifled cannon.

The specifications of the Secretary of the Navy to enable these ships to accomplish this latter condition have been more than fulfilled in their constructions; and when it is considered that their boilers and engines can be protected by coal or other suitable material, that they are fitted with twin-screw engines, and have a rudder area by which their manœuvring power will be very great, and in view of their high speed, they will become, if needed, most effective naval cruisers, and in this connection their very great coal endurance should not be forgotten.

They can carry coal enough, cargo being excluded, to cross the Atlantic and return at their highest speed; and at the ordinary cruiser's speed of 10 to 12 knots, they can steam for 66 days without replenishing their coal a distance of 19,000 knots.

These are the most striking features in these vessels, but they have necessitated and have been accompanied by many other smaller novelties

which will add to the safety, comfort, and convenience of the passengers, and to the general fulfilment of the purpose of such a vessel.

The motive power to propel these new vessels consists, as has already been intimated, of pairs of quadruple expansion vertical six-cylinder engines on four cranks, driving twin screws, with working pressure of 200 lbs. of steam, supplied by six double-ended and four single-ended boilers, and calculated to develop about 18,000 to 20,000 collective I.H.P. No prediction as to actual performance will be offered by the management; but it is well known that the contract between the United States Post Office Department and the International Navigation Company requires that the ships shall be capable of a sea-speed of not less than 20 knots an hour, in ordinary weather.

Besides the main propelling machinery, there are 49 auxiliary engines in each ship. Some of these are of course employed in connection with the main engines, for such purposes as pumping water or air, or for driving blowers for forced draught, or for steering the vessel, or for handling the anchors, etc.

Twelve engines are used for lighting and ventilating the ship, independent of the propelling machinery.

The steering apparatus is of the screw-gear type, with Williamson's steam-and hand-steering engine.

The anchors are of the Hall and Trotman patterns.

A New York newspaper boasted that the *Paris* would deliver the United States mails in London "four or five hours sooner than any other steamship afloat." This she has failed to do, the *Majestic* having delivered her mails, *vid* Queenstown, as early, and occasionally a little earlier, than the *Paris*, leaving New York at the same hour. It did not need a New York editor to point out the advantages of Southampton. It has been used by British mail packets for over fifty years, but the lack of freight has compelled many of them to go to London, and it can never successfully compete with Liverpool for steerage passengers.

Steel for shipbuilding is now produced in the United States at a very low price, almost as low as in England, and the prospect is that American shipbuilders will soon become severe competitors with the English, Scotch, and Irish builders, as they once were with wooden clipper sailing ships.

The company, however, has recently built two very large screw steamships on the Clyde, exclusively for freight and steerage passengers, between Liverpool and Philadelphia. They are named the *Kensington*, 8669 tons gross, and *Southwark*, 8607 tons gross, and are said to be capable of carrying 7000 tons of cargo, 300 second, and 1200 third-class passengers each, and to run the distance in about eight days.

Such boats are now built to consume a very small quantity of coal, and at unprecedentedly low prices.

. The *New York* has recently made a very fast passage from

Southampton to Sandy Hook in 6 days 7 hours and 14 minutes (3047 knots), an average of 20·15 knots, and beating all records.

Leitch, Mirehouse, Brooks, Kennedy, Watkins, and Land were, or are, the best known of the Inman captains.

INTERNATIONAL NAVIGATION COMPANY'S FLEET.

No.	Name of Ship.	Tons.	I.H.P.
1	St. Louis	10,700	20,000
2	St. Paul	10,700	20,000
3	Paris	10,499	20,100
4	New York	10,499	18,400
5	Berlin	5,526	4,799
6	Chester.	4,470	
7	Southwark	8,607	
8	Kensington	8,669	
9	British Princess	3,926	
10	Lord Gough	3,655	
11	Ohio	3,392	
12	Indiana.	3,158	
13	Illinois	3,126	
14	Pennsylvania.	3,166	
"RED STAR LINE."			
15	Friesland	7,116	
16	Westernland	5,736	
17	Noordland	5,212	
18	Waesland	4,752	
19	Pennland	3,760	
20	Belgenland	3,692	
21	Rhyndland	3,689	
22	Nederland	2,839	
23	Switzerland	2,816	
		129,705	

CHAPTER IX.

THE ALLAN LINE.

IN the year 1825 Captain Alexander Allan, of Saltcoats, in Ayrshire, commanded the brig *Favourite*, trading between Glasgow and Montreal. There were no wharves in Montreal then, and the brig was assisted up St. Mary's current by oxen. Her cargo was discharged on the beach over long planks. Captain Allan was an energetic, enterprising man, and he ultimately settled ashore in Glasgow, building and running several smart little ships in the Montreal trade. He had five sons. James, the eldest, and Bryce, both went to sea and commanded several of these ships. Alexander went into business in Glasgow, and, with James, succeeded to their father's business, the firm being, as it is now, "James & Alexander Allan." Hugh, the second son, was born at Saltcoats, 29th September, 1810. On the 12th April, 1826, being then fifteen, he sailed from Greenock for Montreal with his father in the *Favourite*, and landed at Montreal on the 21st May. For a little over three years he was book-keeper to William Kent & Co., dry goods importers. In 1831 he entered the office, as clerk, of James Millar & Co., afterwards Millar, Edmonstone & Co., ship agents and shipbuilders, and was employed in their shipbuilding business, and in buying grain in the eastern townships for export. In 1835 he became a partner, the firm then becoming Millar, Edmonstone & Allan. The other brother, Andrew, afterwards joined Hugh in Montreal, and they married sisters, daughters of Mr. John Smith, a wealthy importer. After the death of Mr. Millar, in 1838, Andrew became a partner, the firm being Edmonstone, Allan & Co., and as such it continued until the retirement of Mr. Edmonstone about 1860, when it became "Hugh & Andrew Allan," as it now is.

In conjunction with the Glasgow firm they owned a fleet of very fine, fast-sailing little ships, built on the Clyde and trading to Glasgow, Liverpool, and London. Many now living will remember the *Canada*, *Caledonia*, *Cambria*, *Britannia*, *Albion*, etc. They were only 350 to 450 tons register, but they were full-rigged ships,

with ice-blocks round their bows, and they often pushed through the spring ice, the great ambition of their captains being to arrive "first ship" with the spring imports. On one occasion the *Canada* was in Quebec as early as the 15th April, and she once reached Montreal under canvas before an easterly gale.

Hugh Allan was a man of great energy, force of character,



SIR HUGH ALLAN.

enterprise, and tenacity of purpose. In 1852, about the time of the completion of the Atlantic and St. Lawrence Railway, between Montreal and Portland, seeing the success of David Tod's iron screw steamship *City of Glasgow* in the New York trade, he decided that the time had arrived for iron screw steamships to replace sailing ships in the Montreal trade, especially as they could run all winter to Portland, and connect with Montreal by rail.

His capital was not then very large, but the five brothers, in conjunction with William Dow, a wealthy Montreal brewer, George Burns Symes, a Quebec timber merchant, John G. Mackenzie and Robert Anderson, merchants of Montreal, and John Watkins, merchant of Kingston, formed the Montreal Ocean Steamship Company, and contracted with William Denny, of Dumbarton, a celebrated iron shipbuilder, to build and engine the *Canadian* and *Indian*. They were about 1700 tons gross and 1170 nett, with engines of 350 H.P., and cost about \$250,000 each. Their maximum speed was about 11 knots, and they were barque-rigged; dimensions about 270 × 34. They were handsome ships, designed to carry large cargoes, with narrow saloons below deck, the state-rooms for about eighty first-class passengers being around the saloon, and the steerage being devoted to emigrants. The firm retained most of their sailing ships, and afterwards added many larger, built at Quebec, St. John, N.B., and Glasgow, the later ones being iron ships. The channel in Lake St. Peter was then in process of being deepened, but for many years lighters had to be employed to complete the ships' cargoes at Quebec.

When these boats were launched the terrible Crimean War had just broken out, and there was a sudden demand for steam transports to carry troops, horses, and munitions of war, both from England and France, to the Crimea. The high rates offered tempted the Allans, and in 1854 and in 1855 the two boats earned a great deal of money. In June, 1852, the Canadian Government advertised for tenders for the carriage of mails by steamships, once a fortnight, between Liverpool and Quebec in summer, and Portland in winter. The Allans not being then in a position to tender, the contract was awarded to Messrs. McKean, McLarty & Lamont, of Liverpool.

The first ocean steamship, the *Genova*, reached Quebec on the 9th May, 1853, and Montreal on the 13th, when she was visited by many thousands, and the event was celebrated by a great and hilarious banquet. She was a small iron boat of only 800 tons, and was followed by the *Cleopatra*, of 1467 tons, and a wretched, slow, old boat called the *Sarah Sands*. Neither of them was fit for the service, and it was consequently very irregularly performed.

In 1854 two newer vessels, but small, the *Charity* and the *Ottawa*, were added. In the spring the gulf ice was so heavy that sailing ships were detained in it for a month, and the mail boats had to put back and go to Portland. They rarely kept the contract time, and after eighteen months' trial the service was so unsatisfactory that the Government cancelled the contract, and in



"MORAVIAN."



1855 made another with Mr. Hugh Allan, paying an annual subsidy of about \$120,000 a year for a fortnightly line. Two new boats were then ordered from Mr. Denny, of the same size and power as the *Canadian*, but the saloons were placed on deck, like the early Cunard boats. They were named the *North American* and *Anglo-Saxon*, and in April, 1856, the former opened the service. Mr. Bryce Allan then retired from the sea and established a branch house in Liverpool, as Allan Brothers, and Messrs. G. B. Symes & Co. acted as agents in Quebec.

The ships were admirably suited for the trade, carrying large cargoes out and home. The *Anglo-Saxon* once ran from Quebec to the Rocklight, Liverpool, in 9 days 5 hours, while sailing ships often took 30 to 40 days. William Grange commanded the *North American*, Andrew McMaster the *Anglo-Saxon*, William Ballantine the *Canadian*, and Thomas Jones the *Indian*. They were well patronised by passengers, the first-class fare being 18 guineas outwards and \$80 homewards—much lower than those charged by the Cunard or Collins boats. The freight charged for fine goods outwards was 50s. per ton of 40 feet, and 30s. per 20 cwt. for metals, at first, and homewards they got 20 to 30 cents a bushel for grain, with flour and deals to fill up; but the coal bill was then heavy. They sailed from Quebec punctually at 9 A.M. every alternate Saturday, and from Liverpool on Wednesdays, generally arriving at Quebec, *via* Belle Isle and north of Anticosti, in summer, on Sundays. The service was performed in a very satisfactory manner, and it was soon realised that the line was a success.

But early in 1858 the brothers decided that a weekly line was essential to complete success. The Government concurred, and an increased subsidy of \$208,000 per annum was promised, being \$4000 per round voyage; but Mr. Symes and the other partners deemed a weekly service premature. In consequence the Allans bought them out and became sole owners, Mr. William Rae being despatched to Quebec to open a branch of the firm under the title of Allans, Rae & Co.

To carry out the new contract they ordered from Mr. Denny four larger boats, designed by Rennie. These were the *North Briton*, *Nova Scotian*, *Bohemian*, and *Hungarian*, all alike, and each measuring about 2200 tons gross, with engines of 400 H.P. They were large carriers, but rather slow. They had full poops and much finer saloons than the Cunard boats. But times were bad; the severe panic of 1857 had seriously affected trade on both sides of the Atlantic; imports fell off, and grain freights were low. The Allans appealed to the Government for further aid, showing

some temporary loss. The country was now proud of the ships, and the Government, being unwilling to lose their services, at length consented to double the subsidy, making it \$416,000 a year, but they made stringent terms as to speed, and imposed heavy penalties for delays in delivering the mails. Soon afterwards trade improved, and the Allans made money very fast. To shorten the time for the mails the boats called at Moville, on Lough Foyle, in the North of Ireland. Extensive wharf property, too, was bought in Quebec. They also built three smaller boats to run between Glasgow and Montreal, the *St. Andrew*, *St. George*, and *St. Patrick*, about 1400 tons each; and they afterwards added a fourth, the *St. David*, of 1600 tons.

In 1861 they launched the *Norwegian* and *Hibernian*, of 2400 tons and 450 H.P., also built by Denny. They were faster than the previous boats, and were the first built with "spar decks" fore and aft, without bulwarks, an arrangement which not only added to the safety of the ships, but also to the comfort of the passengers in bad weather. They now appear to have quarrelled with Denny, for in 1863 they turned to Robert Steele, of Greenock, then the first naval architect on the Clyde. He built for them two very fine ships of 2600 tons and 500 H.P., the *Peruvian* and *Moravian*. They were beautiful models with very fine lines, and were long considered to be the handsomest screw steamships sailing out of Liverpool. They were fast, but they proved to be "pickpockets," *i.e.*, their carrying capacity was small. Very long ships were now coming into fashion, giving more capacity for cargo and greater speed. Ultimately, both of these ships were lengthened, as were also the *Nova Scotian*, *Hibernian*, *St. Andrew*, and *St. David*, and all much improved. For the sake of uniformity the names of the two latter were changed to *Waldensian* and *Phœnician*.

But the history of this company for the first ten years of its existence was a very remarkable and a very sad one. There was no lack of skill or experience on the part of the owners or captains, and no serious defects in the ships. Yet they lost eight ships in eight years, besides minor accidents, and what was far worse, the loss of life was very heavy and distressing. Disaster after disaster occurred, apparently without end. On the 1st June, 1857, the first *Canadian* was wrecked on a well-known rock, fifty miles below Quebec, on a clear night, solely through the stupidity of an incompetent pilot, Captain Ballantine having just left the bridge, after being there for forty-eight hours in a fog. On the 21st November, 1859, the *Indian* was wrecked near Halifax in thick weather. On the 20th February, 1860, the *Hungarian*, during a heavy gale,

mistook a light near Barrington, Nova Scotia, for Cape Sable light (the latter has but one light, while the former has two ; and some say one of these had accidentally gone out), ran ashore, and every soul on board perished. On the 4th June, 1861, a second *Canadian* was crushed by field ice at the entrance of the Straits of Belle Isle, and sank ; and on the 5th November the *North Briton* was wrecked on the Mingan Islands (going north of Anticosti, as they all did then) in a snowstorm. On the 27th April, 1863, the *Anglo-Saxon* went to pieces near Cape Race in a fog ; and on the 14th June following the *Norwegian* was lost on St. Paul's Island through running full speed in a dense fog ; and lastly, on the 22nd February, 1864, the *Bohemian* struck on the Alden Rock, near Portland, Maine, while waiting for a pilot. It is difficult to account for these disasters even now. Something was probably due to the heavy penalties imposed by the Government for delaying the mails, but the truth is that the navigation of a ship from Ireland to New York, or even Boston, is mere child's play compared with the navigation of a ship from Ireland to Montreal. The St. Lawrence, from Bic to Montreal, a distance of three hundred miles, contains a series of sunken reefs, shoals, and flats, and to make matters worse, the tides do not run true, and the channel is often very narrow. They had to contend with snowstorms and ice in the spring and fall, and occasionally with fogs in summer. The river, too, was badly lighted, and most of the pilots were then incompetent to take charge of a large steamship, to which they were unaccustomed. The Straits of Belle Isle were often blocked with ice, and the currents changed with the winds, while the soundings were not to be trusted.

Then in those days the deviation of the compass was a great difficulty in all iron ships, and there was a strange local attraction in some parts of the St. Lawrence which was attributed to deposits of iron.

Most ordinary men would have broken down under such a strain and have given up the experiment in despair ; but the Allans were no ordinary men. They never wavered, but held on with true Scotch tenacity, confident of ultimate success. As the ships were partially insured, the pecuniary loss was not heavy, and as there was no competition they paid well when they kept clear of accidents.

At length the clouds broke, and a splendid success was achieved, benefiting the whole Dominion, and enriching the Allans. Floating compasses overcame the deviation difficulty ; the Government lit up the river and gulf ; special pilots were retained for the exclusive

service of the company, and stationed at Father Point, near Rimouski; telegraphs were extended, and more powerful ships were built, Montreal having determined to make the channel $27\frac{1}{2}$ feet deep throughout.

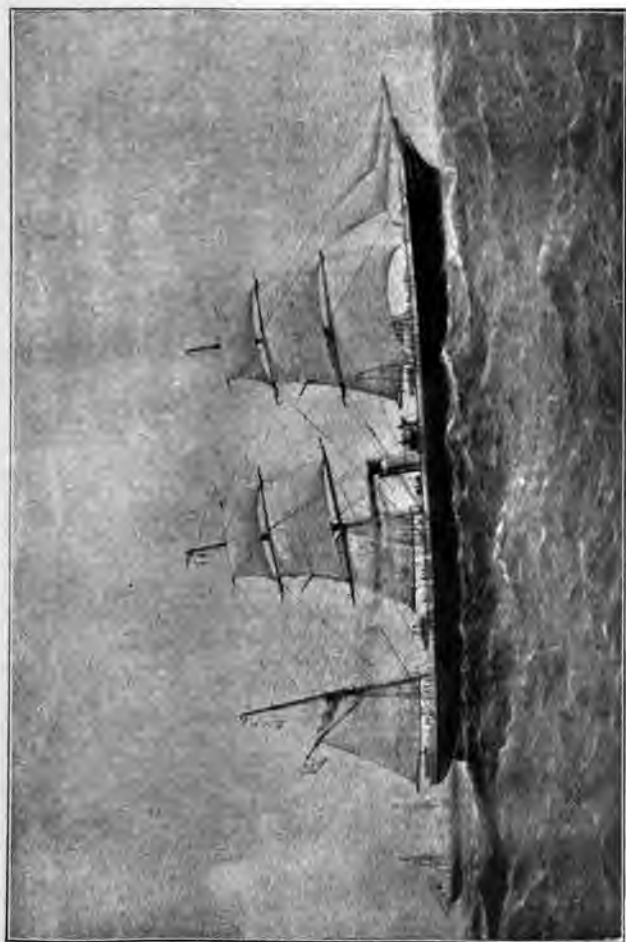
At a public dinner given to Mr. Hugh Allan by the citizens of Quebec in 1857 or 1858, the writer heard him say that in his opinion "ships of about 1700 tons were the most suitable for the Montreal trade." He lived to see the size of his own grow to 5300 tons, and to form one of the most efficient, regular, and successful lines in the world; to be knighted by his Sovereign for his eminent services to Canada and the Empire; to be the president of a great bank and a great telegraph company; to become a millionaire, and to live in a palatial mansion on the beautiful mountain which overlooks Montreal. Such were some of the results of Scotch-Canadian pluck and perseverance!

To return. As the heavy losses of ships occurred at short intervals there was no time to build new ships, so in order to keep to the letter of the contract with the Government they bought several second-hand ships. The *Jura* from the Cunards, the *Hammonia* (re-named the *Belgian*), a German ship, the *William Penn* (re-named the *European*), and the *Damascus* (re-named the *Corinthian*). The three last, after a time, were resold; the *Jura* was wrecked on the Liverpool sandbanks in trying to avoid a collision. The *North American* ran ashore on Anticosti, but was rescued and repaired, and ultimately sold and converted into a sailing ship, as was also the *St. Patrick*.

They built a second *Canadian*, a fast boat, but she had a short career, being crushed by ice at the entrance of the Straits of Belle Isle, as already mentioned. They also bought the *Caspian*, 2728 tons, built at Govan in 1870, the *Ottawa* (re-named the *Manitoba*), built by Laird of Birkenhead in 1865 (afterwards lengthened), 2975 tons ($338 \times 35 \times 34$), both still running, and a large, cheap, East-country built freight boat from the National Company, the *Germany*. The last-named boat they chartered for a South American voyage, during which she was totally wrecked in the River Gironde, below Bordeaux.

From this time fortune favoured them, and they have had a long spell free from serious accidents. For over twenty-five years they have carried on a weekly mail service on this dangerous route, besides several other lines, without the loss of a single passenger, and only one mail steamship, the *Moravian*, carried out of her course by an unusual current, and wrecked near Cape Sable.

They became their own underwriters and saved a large sum of



"SCANDINAVIAN."

money in insurance premiums, which must have far more than covered all their losses from accidents.

To return. Steele's boats being very costly, in 1866 they contracted with Barclay & Curle, of Glasgow, for two boats, the *Nestorian*, 2726 tons ($317 \times 38 \times 32$), and the *Austrian*, 2682 tons, ($319 \times 38 \times 32$), both 450 H.P. They proved to be well-built ships, with good speed, and they have both run for twenty-eight years without a single serious mishap.

Then in 1869 Steele built for them the *Prussian*, of 3030 tons ($340 \times 40 \times 32$), 500 H.P., and in 1870 the *Scandinavian*, 3068 tons ($338 \times 40 \times 33$), 500 H.P., both very fine ships, and both still running.

In 1870-1 they also contracted with Steele for two magnificent ships, much longer and larger than any previous ships; the *Sarmatian*, 3647 tons ($370 \times 42 \times 35$) and 650 H.P., was launched in 1871. She had four cylinders, two vertical and two horizontal, and proved to be exceedingly fast, but hard on coals. She was chartered by the Imperial Government for the Ashantee expedition of 1874 as a transport, and was selected to carry General Wolseley's telegram announcing the capture of Coomassie to Gibraltar. She has since been fitted with new compound engines of smaller power, consuming much less coal, and is still a very efficient boat.

The other was the *Polynesian*, launched in 1872, built on the same lines as the *Sarmatian*, but 30 feet longer ($400 \times 42 \times 35$), 3983 tons and 675 H.P. On her first voyage she ran from Quebec to Moville in 7 days 18 hours and 55 minutes, and proved herself to be a very fine ship. After running successfully for sixteen years she came into collision with the *Cynthia* (ss.) off Longue Point, just below Montreal, on the 22nd May, 1889, nearly "end on," but her collision bulkhead saved her, and she was repaired at Quebec. The *Cynthia*, however, sank with four or five of her crew, and as the Vice-Court of Admiralty held the *Polynesian's* pilot to be in fault the Allans had to pay all damages and costs. She has since been improved and re-named the *Laurentian*, and is still carrying the mails.

In 1872 they also bought a third *Canadian*, a Liverpool built freight boat, 2911 tons, 280 H.P. ($349 \times 35 \times 25$), but she proved weak, and had to be strengthened.

To keep all these boats fully employed they contracted to carry a fortnightly mail to Halifax, and then with the Government of Newfoundland for a fortnightly direct mail in summer, and bought a small, Quebec built, wooden boat, the *Newfoundland*, 919 tons,

130 H.P., to carry the mails between St. John's and Halifax in winter. These boats went on to Baltimore for return cargoes, as did also the winter mail boats for a time, owing to a quarrel with the Grand Trunk Railroad Company.

When the contract was renewed, the Canadian Government consented to a new clause exempting the mail boats from penalties for delays when caused by fogs, but they reduced the subsidy in consequence. To this new clause the Allans have always attributed their comparative freedom from losses since.

Steele also built for them the next two boats, the *Circassian* in 1873, a boat of extreme length, but less beam and tonnage, 3724 tons and 550 H.P. ($415 \times 40 \times 33$). Her engine had a new patent valve, but after a time it had to be removed owing to the great noise it made. She has been a very fortunate boat, but on one occasion broke her main shaft and had to be towed to Halifax. The other was the *Sardinian*, 4384 tons, launched in 1875 ($400 \times 42 \times 34$), fitted with compound engines of 675 H.P. She has been unfortunate. She caught fire off Moville from an explosion of coal gas and had to be scuttled and then raised; then she lost her rudder in mid-ocean and had to be towed to Liverpool by the *Texas*, after transferring most of her passengers; cut down a schooner, and afterwards lost her screw, and was towed to Halifax.

Finally, they went to Robert Napier & Sons (builders of the celebrated *Persia*, *Scotia*, etc.) in 1880 for their crack mail boat, the beautiful *Parisian*, launched in 1881. She surpassed anything that had been seen on the St. Lawrence, with bilge keels to prevent rolling, midship saloon, electric lights, etc. She is 5365 tons gross ($440 \times 46 \times 33$) and 800 H.P. In 1890 she ran from Moville to Rimouski in 6 days 16 hours, an average of $14 \cdot 37$ knots. She has had a remarkable career, for during the thirteen years she has been running she has made over 150 passages, and has never met with an accident or made a long passage; she has always been a great favourite with passengers, generally being full. On a recent occasion she carried 240 saloon passengers, and she has often carried 1000 steerage. Such a record is unprecedented in the St. Lawrence route.

They intended to build a boat of 6000 tons, but as the subsidy for carrying the mails had been reduced to \$126,000 a year, and there was a doubt as to its renewal, they abandoned the idea.

It is a great mistake to suppose that such a subsidy is all profit to a steamship company; indeed, the Allans declare that it has been entirely unremunerative. A mail contract necessarily ties



"PARISIAN."

the boats down to a fixed day, and a fixed hour of sailing—in itself a great drawback ; it also compels the boats to run at a high rate of speed, which tells upon the coal bill ; and it frequently involves detention for the mails, as well as compels them to call at Moville in all weathers, both on the outward and homeward passages. Then in the past they had to provide a large mail-room for sorting the letters, and to carry a mail officer free.

When the Inter-Colonial Railway was opened the boats landed and received mails and passengers at Rimouski, 165 miles below Quebec, and in winter called at Halifax N.S. for the same purpose instead of running direct to and from Portland, Maine.

The Glasgow trade having increased, the old boats were found too small and obsolete, and they decided on a weekly line of larger boats. In 1875 the export of live cattle, sheep, and horses to Great Britain commenced, and has grown to such importance that in 1889, 89,000 cattle and 59,000 sheep were exported from Montreal, and in 1890, 123,000 cattle and 42,000 sheep, and they were found to pay the ships better than goods. Owing to the restrictions enforced in Great Britain the export of cattle in 1894 fell off, but sheep and horses were exported in much greater numbers. Then, compound engines reduced the consumption of coal so much, and steel ships were so much lighter than iron ships, that new boats could be built to carry immense cargoes of dead-weight. The price of steel, made by the Siemens-Martin process, too, having fallen so low, steel ships were built at much lower prices than iron ships. Taking advantage of these circumstances the Allans built or bought a number of large boats of moderate speed, but specially adapted for cattle and goods. In 1879 they launched one of the first boats ever built entirely of steel, the *Buenos Ayrean*, at Dumbarton. She is 4005 tons gross, and 500 H.P. ($385 \times 42 \times 30$). In 1880 they bought the *Grecian*,* built at Sunderland, 3613 tons ($360 \times 40 \times 31$), 400 H.P. In 1881, the *Corean*, also built at Sunderland, 3488 tons ($360 \times 41 \times 31$), 400 H.P. The *Hanoverian*, 3800 tons, and the *Lucerne*, built at Birkenhead in 1878, 1925 tons ($291 \times 34 \times 24\cdot6$), 220 H.P. In 1884 they launched at Govan, on the Clyde, two fine boats, the *Carthaginian*, 4214 tons ($386 \times 45 \times 29\cdot4$), 520 H.P., and the *Siberian*, 3904 tons ($372 \times 45 \times 28\cdot7$), 500 H.P., both specially fitted for cattle. They also bought from the Inman Co. the *City of New York*, No. 2 (originally the *Delaware*), built on the Clyde in 1865 ($375 \times 39\cdot6 \times 33$), 3523 tons, 350 H.P., and re-named her the *Norwegian*. From the Monarch Line they afterwards bought, at very low prices, the *Grecian Monarch* (now the *Pomeranian*), 4364 tons

(381 × 43 × 33), 550 H.P., built at Hull in 1882, and the *Assyrian Monarch*, now the *Assyrian*, 3970 tons (360 × 42·7 × 32), 500 H.P., built at Hull in 1880. As Montreal could not employ them all, they established a weekly line between Glasgow and Boston, and a fortnightly line between Glasgow and Philadelphia. Then they turned to London and established a tri-monthly line between that port and Montreal. The London dock labourers, however, gave them a great deal of trouble and annoyance, and at one time stopped their ships for weeks.

To manage these ships offices were opened in Boston, Philadelphia and London—branches of the parent firm. An agency was also established in Chicago, where large contracts are made for the carriage of grain and provisions.

To prevent a protracted fight between the Allans and the Dominion line, the former consented to share the mail subsidy with the latter, two of the Dominion boats, the *Vancouver* and *Labrador*, carrying the mails.

A Glasgow firm, Donaldson Brothers, engaged in the River Plate trade, having started an opposition line of boats between Glasgow and Montreal, the Allans immediately started an opposition line between Glasgow and the River Plate, sending out a couple of their smaller boats, and building, in 1887, the *Monte Videan* and *Rosarian*, each of 3077 tons and 350 H.P. (330 × 42 × 24). There is a large trade now done from thence in wool, hides and frozen mutton, and latterly some live cattle and sheep have been carried, but the financial troubles of Buenos Ayres have seriously interfered with the trade.

In 1890 they built at Partick for the London trade the *Brazilian*, 3204 tons and 350 H.P. (340 × 42 × 25), and in 1891 they launched from the same place two very fine boats specially designed to carry large cargoes both of goods and live cattle at good speed, but with accommodation for only a limited number of saloon passengers. These boats may be considered model ships for the purposes for which they were designed, and are the latest productions for the line. They were named the *Mongolian* and *Numidian*, both alike, 4909 tons gross and 600 H.P. nominal (400 × 45 × 30·6), with triple expansion engines, cylinders 30, 50 and 80 inches in diameter with 5 feet stroke, capable of driving the boats 14½ knots. They were designed to carry 5000 tons of cargo, with a large number of cattle. They have done their work well, without accident, but the extraordinary low rates of freight have probably rendered them unprofitable for the time.

Taking advantage of the financial difficulties in which the

State line, running between Glasgow and New York, became involved, the Allans purchased the whole six boats, viz.—

	Tons.	H.P.
The State of Nebraska	3,986	650
„ „ Nevada	2,488	400
„ „ Indiana	2,584	400
„ „ Georgia	2,489	400
„ „ Pennsylvania	2,483	400
„ „ Alabama	2,313	250

They appear to have sold the four last named, but they run the first two with some of the other boats between Glasgow and New York weekly, in connection with the *State of California*, a fine new boat, built in 1891 for the State line, but bought or managed by the Allans. She is 4244 tons and 700 H.P. nominal ($386 \times 46.1 \times 29.6$). Thus the one line of four small boats has gradually developed into eight lines, employing 33 ships, measuring 112,052 tons, besides a small iron collier of 931 tons, the *Acadian*, running between Nova Scotia and Quebec. But this is not all. Having at length sold all their wooden sailing ships, they built a number of iron sailing ships, some four-masted, of 1500 to 1800 tons, which, driven out of the Montreal trade, run to Calcutta, Burmah, and California—about all that is left for such ships now. These in turn could not compete with modern steamships, and most of them, if not all, have been sold.

With such a fleet it is remarkable that—excluding the one mail boat, the *Moravian*, already mentioned—they have only lost two freight boats during the last twenty-five years—the little *St. George*, on the Brazil Rock, and the *Hanoverian*, which, being driven out of her course in a dense fog, was lost in St. Mary's Bay, near Cape Race. No lives were lost in either case.

In the matter of speed it is quite true that the Allans have not kept pace with the times; but for this they have very good reasons to offer.

The great trouble with iron and steel steamships in modern times has been that they so rapidly become obsolete and thus depreciate in value. Thus the once crack boat of the Cunard line, the *Persia*, which cost originally fully £130,000 sterling, was sold for old iron at £10,000 when nearly as good as new; and very recently the Allans had to sell their *Nova Scotian* for a nominal sum (said to be £5000)—although £90,000 had been spent upon her in lengthening and giving her new engines and boilers—because she was out of date. It is thus a dangerous experiment to build

new and costly fast boats without a liberal subsidy for carrying the mails for a fixed term of years.

As far back as 1887 the Canadian Government decided to subsidise a line of fast Atlantic steamships to carry the mails in competition with New York. They advertised for tenders, but in doing so they made two fatal mistakes; they insisted on an average speed of 20 knots an hour, and made it imperative that the boats should call at a French port.

The Allans have always asserted that the first demand was impracticable, for many reasons, the two chief ones being that the speed would be dangerous owing to ice and fogs, and that no reasonable subsidy would make such boats pay, and that calling at a French port was quite out of the question. But they sent in a tender for a weekly service, with a guaranteed *average* speed of 17 knots, for a subsidy of £104,000 sterling, or \$500,000 per annum, for ten years. This would have reduced the time from Moville to Rimouski to 5 days 16 hours, and mails and passengers would ordinarily have reached Quebec in as short a time as the fastest boat in the world could deliver them at New York from Queens-town. At the same time Anderson, Anderson & Co., of London, tendered to supply a line of boats, "capable of running 20 knots," for the same subsidy. Allured by this offer of 20 knots, which was really no better than the Allans tender, the Government unfortunately accepted, conditionally, the Anderson tender. They, however, failed to raise the necessary capital, and the matter came to nothing. In the session of 1889, however, Parliament voted a sum of \$500,000 per annum for the service, and negotiations were entered into with Mr. Bryce Douglas, representing the Naval Construction and Armaments Co., of Barrow, for a 20-knot service; the Government offered \$750,000 a year for the first five years, and \$550,000 for the next five. This was declined, but a counter proposal was made for a ten years' service at \$750,000 a year. Sir John Macdonald agreed, and the company appeared to have every prospect of success when the unexpected death of Mr. Douglas deprived the company of its very able manager; in 1891 the Duke of Devonshire telegraphed finally declining the offer. The Allans then offered, without approving of the scheme, to give a 20-knot service for £5000 a round voyage, or £260,000 a year, or a 16-knot service for \$750,000 a year; but both were declined. Mr. Furness, of West Hartlepool, also offered a 20-knot service for £200,000 a year, but wanted a four-per-cent. guarantee on an estimated capital of £1,250,000. This was also declined, and the matter remained in abeyance till 1893, when Mr. Hector Cameron

and Mr. James Bruce, backed it would appear by R. Napier and Sons, of Glasgow, proposed an 18-knot service for a subsidy of \$750,000 a year. The Government was willing to negotiate on this basis, and appointed a meeting in Ottawa for January, 1894; but Mr. Bruce failed to appear until March, and in the meantime the Government accepted an offer of Mr. James Huddart, of Sydney, N.S.W. (the contractor for the Vancouver-Australian Line), to give a 20-knot weekly service for \$750,000 a year.¹ In June, 1894, the Inter-colonial Conference met at Ottawa, and approved of Mr. Huddart's offer, as did also the Earl of Jersey, representing the Imperial Government. Mr. Huddart asked for an additional subsidy from the Home Government, to which he has, as yet, received no response, and in the meantime he refrains from any attempt to raise the necessary capital.

So the matter stands at this moment (May, 1895). Thus five years have been lost, during which much of the best traffic has drifted to New York for want of a Canadian fast line. The consequence to the Allans is that their business has been, to a great extent, paralysed; for it is one of the evils of the subsidy system that it necessarily injures all unsubsidised lines, and diverts a portion of their passenger and light freight traffic. To build fast and costly boats in such circumstances would have been madness, and thus the Allans have been compelled to jog along for five years with their old boats, with this subsidy business hanging over their heads. In the meantime they have agreed from year to year to carry the mails by their fastest boats, in conjunction with two of the best of the Dominion line boats.

At the session of the Dominion Parliament in 1894 the increased subsidy of \$750,000 was sanctioned.

The Allan Line has met with two or three minor accidents during the past year. The *Corean* was compelled to return to Ireland in February last owing to a leak in her stoke-hole, which was easily remedied. The *Scandinavian*, bound home, struck an iceberg when going dead slow in a fog, and the *Assyrian* touched ground at Barnaby Island. No serious damage, however, was done to either ship. As a set-off, the *Monte Videan* fell in with the *Sarnia*, disabled, and towed her to Queenstown; and by a singular coincidence the *Norwegian*, in December last, fell in with the same ship with loss of rudder, and towed her to Malin Head, both being meritorious services, for which salvage has been, or will be, paid.

¹ *Montreal Gazette*. The government, too, guaranteeing to pay interest on a large amount of the company's bonds.

Freights both east and west have been for some years extremely low, and the passage money has been cut down by competition. In the sixties as high as 30 cents a bushel was paid for grain from Montreal to Liverpool. In 1894 it was carried at 4½ cents,¹ cheese at 15s. per ton, cattle at 30s. per head, and deals at 30s. per standard, and the Allans have had to carry goods outwards at 10s. to 15s. per ton, against 30s. and 50s. thirty years ago, while many transient boats have had to come out in ballast. The effect is that the Beaver Line has had to go into liquidation, and the Dominion Line has changed hands after sinking most of its capital. But a great concern like the Allan Line has many advantages. Owning so many ships, they can afford to be their own underwriters, and of late years their insurance account must have left a large profit. Then the family being a very large one, the offices in Glasgow, Liverpool, London, Quebec, Montreal and Boston are all managed by sons or relatives of the original founders, and thus practically most of the commissions are saved—a very large item. These two items alone will pay a fair dividend on the capital invested, even supposing that the boats' earnings only cover, in addition, their ordinary working expenses, wear and tear.

Bryce Allan died suddenly in 1874, and James followed him some years later. Hugh was knighted by the Queen in 1870. In 1872 he determined to have his name associated with the great Canadian Pacific Railway, and formed a syndicate to build it. Happily for himself and his family the fall of the Macdonald Government in 1873 defeated his plans. His ambition was unbounded. In 1872 he boasted to the writer that he had "never known a day's sickness," but in 1879 he had a severe attack of gout, and was advised to give up business for a time and take a trip to the Cape of Good Hope. Like the late Earl of Derby he said "he preferred the gout," and in 1882, when travelling in Scotland, he succumbed to a second attack in Edinburgh, aged 72. His remains were brought out to Canada in one of his own ships, and rest in the beautiful cemetery on Mount Royal. He left his large fortune, variously estimated at six to eight million dollars, exclusively to his numerous family.

It is such men—and there have been, and still are, many of them—who have built up, under the ægis of the British flag, not only the beautiful city of Montreal, but this great Dominion. The McGills, the Moffatts, the Molsons, the Allans, the Workmans,

¹ In 1895 it has been carried as low as three cents per bushel.

the Greenshields, the Redpaths, and others have found worthy successors in the Smiths, the Stephens, the McLennans, the Gaults, the Mackays, and the Macdonalds of our day ; and the net result is that Canada stands out to-day as one of the happiest and freest nations in the world, its people living in peace and contentment under equal laws, and enjoying liberty without licence. Using the words of "Fidelis," the gifted writer of Canadian verse, let us hope that—

" In the long hereafter this Canada shall be
The worthy heir of British power and British liberty ;
Spreading the blessings of her sway to her remotest bounds,
While with the fame of her fair name a continent resounds.
True to her high traditions, to Britain's ancient glory
Of hero and of martyr, alive in deathless story ;
Strong in their liberty and truth, to shed from shore to shore
A light among the nations till nations are no more."

Alexander Allan died at Glasgow on the 2nd April, 1892, leaving personal property valued at two and a half million dollars. Andrew alone remains of the five brothers. He resides on the beautiful Mount Royal, and still keeps up a general oversight of the business, and there are many sons who are carrying on the work, and adding to the fame, of the great "Allan Line."

Among the other best known of the earlier Allan captains were John Graham, James Wylie, Hugh Wylie, Joseph E. Dutton, William H. Smith, Alexander D. Aird, Robert Brown, Niel McLean, William Richardson, and Joseph Ritchie, all able men. Ritchie is the only one now afloat, and commands the favourite *Parisian*. James Wylie, on his retirement, was given a splendid banquet at the "Windsor" by the citizens of Montreal, and William H. Smith a service of plate.

THE ALLAN FLEET.

	Tons gross.
1. Parisian	5,365
2. Mongolian	4,909
3. Numidian	4,900
4. Sardinian	4,384
5. Pomeranian	4,364
6. Carthaginian	4,214
7. Buenos Ayrean	4,005
8. State of Nebraska	3,986
9. Laurentian	3,983
10. Assyrian	3,970
11. Sarmatian	3,920
12. Siberian	3,904
13. Circassian	3,724
14. Grecian	3,613
15. Norwegian	3,523
16. Corean	3,488
17. Peruvian	3,263
18. Brazilian	3,204
19. Rosarian	3,077
20. Monte Videan	3,076
21. Scandinavian	3,068
22. Prussian	3,030
23. Hibernian	2,997
24. Manitoban	2,975
25. Canadian	2,911
26. Caspian	2,728
27. Nestorian	2,726
28. Austrian	2,682
29. State of Nevada	2,488
30. Phoenician	2,425
31. Waldensian	2,306
32. Lucerne	1,925
33. Acadian	931
34. Newfoundland	919
	<hr/>
	112,983

CHAPTER X.

THE WHITE STAR LINE.

THE White Star Line, although commenced later on, stands next in importance among the British lines, and now owns some of the longest, the finest, and the fastest ships in the world. As the Cunards have always preserved A, and the Allans N, so this line has preserved C as the terminal letter in their ships' names.

It was in 1870 that an enterprising firm of Liverpool shipowners, Messrs. Ismay, Imrie & Co., who owned the White Star flag, decided that the time had arrived for a superior class of screw steamships to run between Liverpool and New York. They did not go to the Clyde for them, but to Harland & Wolff, of Belfast.

Edward James Harland, the now celebrated naval architect, is the fourth son of a Yorkshire physician, the late Dr. William Harland, of Scarborough, where he was born in 1831. After being a few years at the Edinburgh Academy he was apprenticed in 1846 to the firm of Robert Stephenson & Co., Newcastle-on-Tyne, who were extensive builders of locomotives, and also marine and land engines.

Upon the completion of his articles he entered the drawing office of Messrs. J. & G. Thomson, Glasgow, where he was engaged until 1853, when he took over the management of a shipbuilding yard in Newcastle-on-Tyne, belonging to Messrs. Toward. After being there for a short time he was offered a similar post in the Belfast shipyard, then owned by Messrs. Robert Hickson & Co., which he accepted at the end of 1854.

In 1858 the owner retired and Mr. Harland became proprietor of the concern himself, and built his first steamship, the *Venetian*, for Messrs. Bibby & Sons, of Liverpool, launched in 1859. Soon afterwards, in 1860, he was joined by Mr. G. W. Wolff, a German, the son of a Hamburg merchant, where he was born, but who was educated in Liverpool and Manchester.

The extensive business of which Sir Edward is the head is still ably carried on with the assistance of his partners Messrs. Wolff,

Wilson & Pirrie, the two latter of whom were among the first pupils trained by the firm.

The first ship they designed and built for the line was the *Oceanic*, 3808 tons (420 × 42 × 31) and 500 H.P. nominal. She

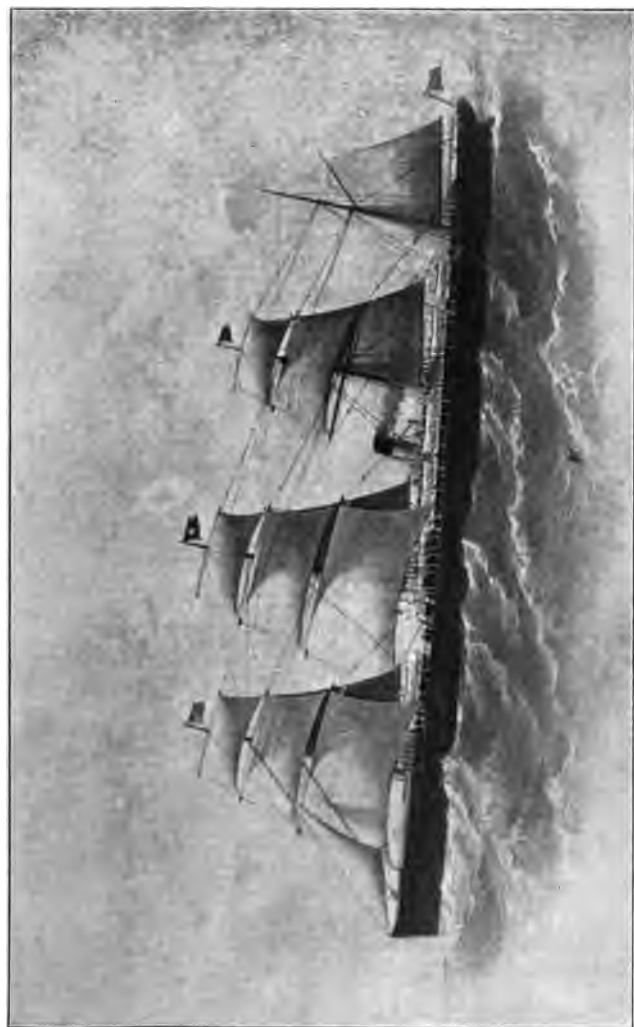


Yours very truly,

E. J. Harland

was launched in 1870. Not only was she longer, larger, and faster than any other boat in the trade, but under the guidance of Mr., now Sir Edward, Harland, several novelties were introduced in her which added much to the comfort of passengers.

Firstly, a midship saloon and state-rooms, which diminished sea-



"OCEANIC."

sickness, and were away from the noise and vibration of the screw ; secondly, in lieu of the rattling water-jugs, water was supplied by taps in the state-rooms ; and thirdly, each room was supplied with an electric bell—a great comfort to passengers, especially when sick—and thoroughly ventilated by fans. The Cunard boats had none of these. The *Oceanic* was a great success, and was speedily followed by three sister ships. In 1872 thus was inaugurated the service now so popularly known as the White Star Line, or “Oceanic Steamship Company.” The first boats were the *Oceanic*, *Atlantic*, *Baltic*, *Republic*, *Adriatic*, and *Celtic*, all being nearly alike (3880 tons gross, 437 feet long, and 600 H.P. nominal), except the last two, which were built 17 feet longer.

The *Oceanic* was afterwards despatched to San Francisco to open a new line between that port and Hong-Kong, *via* Japan. Then they added the *Gaelic* and *Belgic*, 4206 tons. In 1874 they added the *Britannic*, and in 1875 the *Germanic*, longer and faster boats, and sold the *Baltic* (now the *Veendam*) and the *Republic* (now the *Maasdam*) to the Netherlands Line. The new boats were so fast, so regular, and so luxurious that they at once leaped into yet greater popularity, and the other lines had to follow suit. The last two are alike, and the description of the *Britannic* will serve for both. She is $468 \times 46 \cdot 3 \times 34$, 5004 tons gross, 3152 net. Her engines are by Messrs. Maudslay, Son & Field, 760 H.P. nominal, but they indicate at sea 5000. They have four inverted cylinders on the compound principle, the two high pressure being above the two low, 48 and 83 inches in diameter, with 5 feet stroke ; she has 8 boilers with 32 furnaces, the pressure of steam being 70 lbs. to the square inch, and consuming only about 100 tons good coal per day. Her average speed is 15 knots, but the *Germanic* made in one day, going west, 396 knots, or an average of over 16 knots per hour. The *Britannic* reduced the time from Queenstown to Sandy Hook to 8 days, and homewards to 7 days 16 hours. Mr. Ismay says that, like all the White Star Line, she was built without a contract. She cost £200,000, or \$1,000,000.

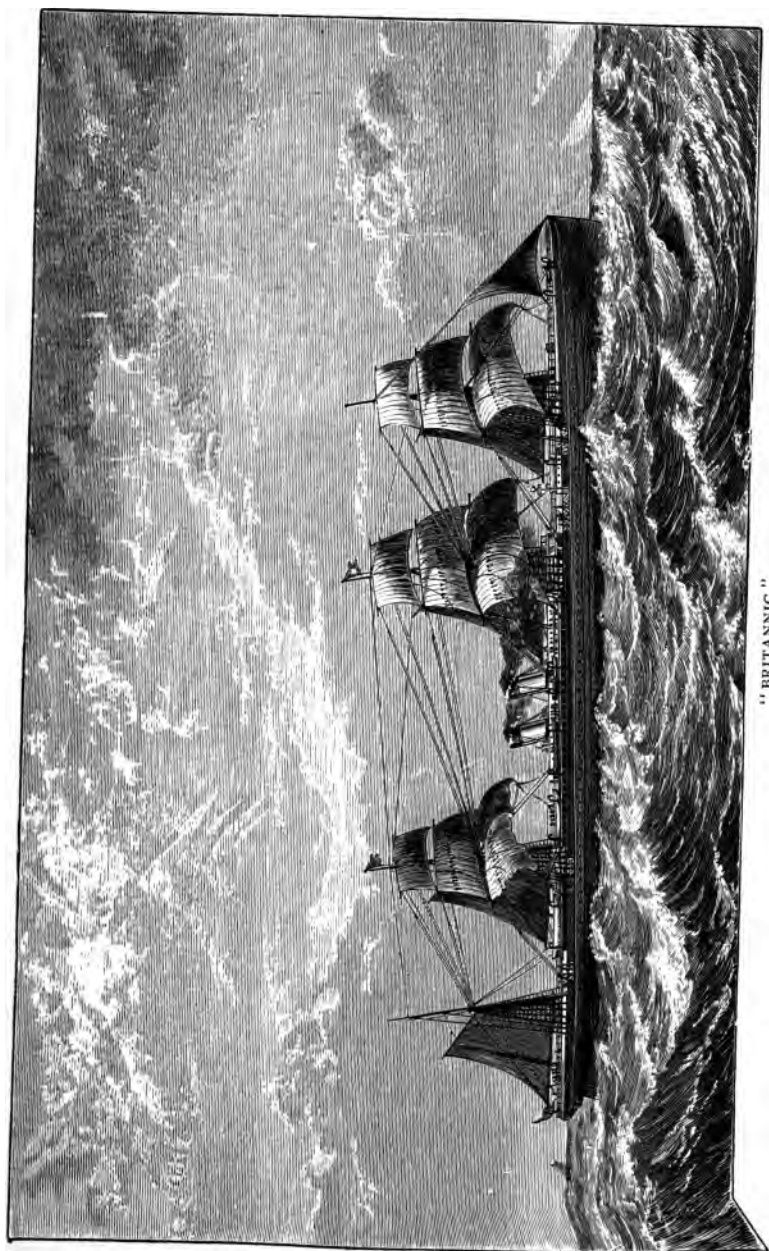
Although the compound engine had been introduced as early as 1856, and was tried successfully by Alfred Holt in the China trade in 1865, the White Star Line was among the first to realise, by their unique arrangement of machinery, its great economy in coal. It has since been generally adopted.

In 1881 they built the *Arabic* ($430 \times 42 \times 32$), 4368 tons, more especially for cargo and cattle, but afterwards sold her to the Netherlands Line, and she is now known as the *Spaarndam*. The *Gaelic* and *Belgic* were transferred to the China Line.

But a melancholy disaster marred the success and injured the popularity, for a time, of these splendid boats, notwithstanding the utmost care on the part of their owners. In March, 1873, owing to heavy westerly gales, Captain Williams, of the *Atlantic*, fearing to run short of coals, bore up for Halifax, and either through rashness, or carelessness, in running for Sambro Light in thick weather, on the 1st April, ran her ashore on the Maris Rock, Prospect Beach, near Sambro Island, where she became a total wreck. She had about 1000 souls on board; 442 were saved, but about 560 perished, chiefly steerage passengers, many dying in the rigging through cold and want. Universal regret was expressed, and the captain was severely censured, his certificate being suspended for two years.

Messrs. Harland & Wolff also built for the company similar ships for the New Zealand trade, such as the *Doric*, 4784 tons, the *Ionic*, 4753 tons, the *Coptic*, 4700 tons, and the *Gothic*, 7220 tons.

In 1885 the Queen conferred a baronetcy on Mr. Harland. For many years previously he had been chairman of the harbour board, and subsequently, for two years, Mayor of Belfast—High Sheriff for county Down in 1887. He was also appointed a justice of the peace for Antrim and Down, and in 1889 he was elected member of Parliament for Belfast, an honour shared by his partner, Mr. Wolff, in 1892, since which they have been relieved by Mr. Wilson and Mr. Pirrie from the more active duties of the firm. In the latter year they launched the largest amount of tonnage built in any yard in the world, viz., 14 steel ships measuring 68,614 tons, 12 of which were steamships, and have headed the list each year since. They have long built their own engines and boilers, and employ 7000 to 8000 hands, much to the benefit of the great and prosperous city of Belfast. The Peninsular and Oriental Company, and other great steamship companies, have had many splendid ships built by this now famous firm. When the cattle trade assumed such large proportions they built for the White Star Line two long, roomy boats, the *Cufic* in 1888, 4639 tons ($430\cdot7 \times 45\cdot2 \times 30$), 520 H.P. nominal, and the *Runic* in 1889, 4649 tons ($430\cdot7 \times 45\cdot2 \times 30$), 520 H.P. nominal. They make about 13 knots on a very moderate consumption of coal, and carry 6000 tons of cargo and 1000 live cattle. They answered so well that in 1891 they added the *Nomadic*, 5749 tons ($460\cdot8 \times 49\cdot1 \times 31$), and 600 H.P. nominal, and the *Tauric*, 5728 tons ($461 \times 49 \times 30\cdot9$), 600 H.P. nominal, and in 1892 the *Bovic*, 6583 tons, and the *Naronic*, 6594 tons, sister ships, (both $470 \times 53 \times 31\cdot6$). These boats carry enormous cargoes, and have done



"BRITANNIC."

their work well. The *Naronic*, however, did not run long, but met with a very sad fate. When hardly a year afloat she left Liverpool for New York on the 11th February, 1893, and was never seen again. The only trace of her was two of her boats, one of which was passed by the steamship *Coventry*, on March 4th, at 2 A.M., in lat. 42° N., and long. 46° W., floating keel upwards, and another twelve hours later riding to an improvised sea-anchor made of oars and spars. What happened to the ship can only be conjectured. An inquiry was held by the Board of Trade, when all that could be proved was that she was in every respect a first-class ship, and that nothing had been spared to secure her safety. She was replaced by a still larger boat the *Cevic*, 8315 tons gross (500 × 60 × 38). She is a twin screw, one of the largest freight boats afloat, and recently carried the largest cargo that ever left New York, consisting of—

140,000 bushels of grain,
9,000 bales of cotton,
3,500 sacks of flour,
400 tons of copper and lead,
300 tons of fresh meat,
8,400 packages of cheese, oil, hides, beef, wax and hay, and
896 head of live cattle.

Outwards these boats, of course, carry large numbers of steerage passengers, but the tendency is now more and more towards separating freight and saloon passengers, the latter demanding great speed, and the former economy in coal consumption, both of which have been successfully achieved in modern boats.¹

The *Britannic* and *Germanic* became great favourites with Atlantic travellers and did their work well. The fastest passage between Sandy Hook and Queenstown made by the former was 7 days 6 hours and 55 minutes, her average speed being 16·08 knots per hour. The *Germanic* did slightly better, doing it in 7 days 7 hours and 37 minutes, but at an average speed of 16·10 knots per hour, wonderful performances, considering the small consumption of coal. But a still more remarkable fact must be recorded. These two boats recently completed 400 passages each across the Atlantic, with only one serious accident, a collision in a fog off Long Island between the *Britannic* and *Celtic*, resulting in the loss of three or four lives. Each boat accomplished about

¹ Since this was written the company has launched the *Georgic* (557 + 60 + 40), carrying 14,000 tons.



"TEUTONIC."

one and a half million statute miles, and both boats were then working as efficiently as ever with their original engines and boilers. They had carried 100,000 saloon and 260,000 steerage passengers on these voyages. Such a record is probably without a parallel in the history of steam navigation.¹

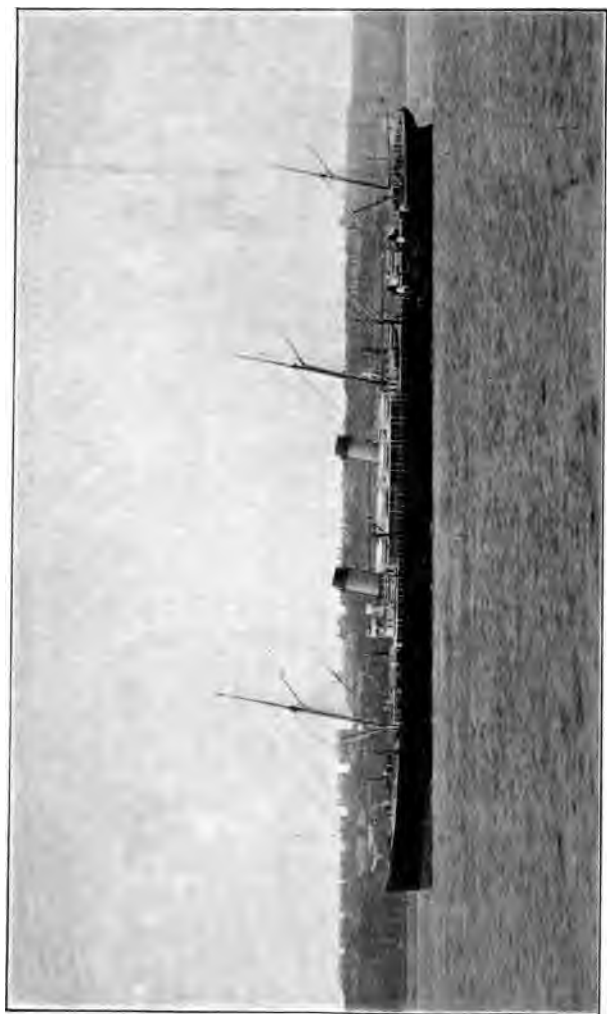
But Sir Edward Harland was not satisfied. He had long contemplated larger and faster ships, which should not only excel anything then afloat, but which should be fitted to act as powerful auxiliaries to the British Navy. This latter idea did not originate with the Government, but with Mr. Ismay, the managing owner of the White Star fleet. He pointed out that boats could be built capable of carrying 2000 infantry or 1000 cavalry with their horses, that would steam from England to Halifax in five days, to the Cape of Good Hope in 12½ days, to Bombay, *viâ* the Suez Canal, in 14 days, to Calcutta in 17½ days, to Hong-Kong in 21, or to Sydney, N.S.W., in 22 days, and that even if the Suez Canal were closed they could reach Bombay in 22 days *viâ* the Cape.

In 1887, in view of the great Paris Exhibition of 1889, the company determined to build two such boats, of about 10,000 tons, that should surpass anything afloat, to be named the *Teutonic* and *Majestic*. It was decided to have twin screws, extreme length of hull, great power, superb fittings, and all the latest improvements. They were also built to the requirements of the Admiralty for armed cruisers or troopships, carrying twelve quick-firing guns, each capable of discharging twelve shots a minute. They were commenced in the spring of 1887.

Beautiful as the two Inman boats are, with their cutwaters and figure-heads—a characteristic of that line—the *Teutonic* and *Majestic*, with their significant straight stems, might be preferred by some. The *Teutonic* was launched in January, 1889, and commenced to run in August, but the *Majestic* was not ready until the 2nd April, 1890. They are longer than the *Paris* and *New York*, but 5½ feet less beam, their dimensions being 582 feet long on deck, 57·8 feet beam, and 39 feet deep; the *Teutonic* measuring 9686 tons gross, 4245 net, and the *Majestic* 9861 gross, and 4340 net. They are built of Siemens-Martin steel, and have three pole masts, but no yards.

To add to their strength the builders introduced a novelty in riveting their outside plates. Instead of butting the plates together, as usual, they overlap each other, and are trebly, quadruply, and in some parts even quintuply riveted together.

¹ London *Times*. The *Germanic* has since been fitted with new engines and boilers, and has lowered her record to 6 days 23 hours.



"TEUTONIC."

This plan, though not quite as sightly, is much stronger than the old plan. The decks are of steel, covered with wood. In addition to ten transverse bulkheads they have a longitudinal bulkhead,



"MAJESTIC" SALOON.

which divides the engine-room in two, the great advantages of which have been pointed out in a previous chapter. The brackets used to support the ends of the screw-shafts were dispensed with, another novelty, the shafts being carried out in what are really

parts of the hull in the run of the ship, the attachment being by a double web of plating, forming almost a complete circle. The screws overlap each other a few feet.

Each boat has two sets of triple cylinders, 43, 68 and 110 inches

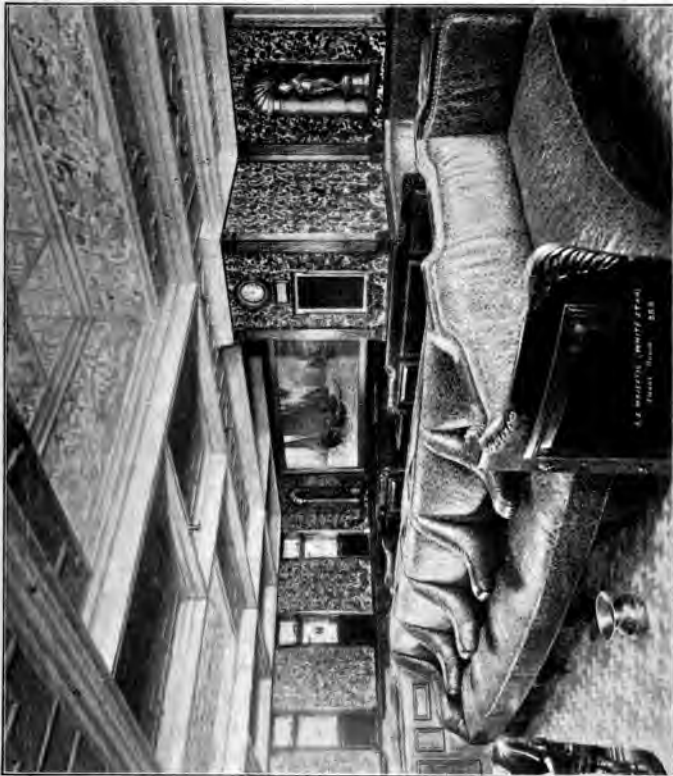


"MAJESTIC" LIBRARY.

in diameter respectively, the engines working up to 16,000 H.P. indicated. According to the requirements of the Admiralty, both engines and boilers are placed below the water-line to protect them from the shots of an enemy, and the great strength of the hulls reduces the vibration to a minimum. Their rudders are also

prepared for being worked below the water-line. The ships are lighted throughout by electricity and fitted with electric bells and all the latest conveniences.

The promenade decks are 240 feet long and 18 feet clear on both sides of the deck-houses. They are covered in by a new



"MAJESTIC" SMOKE-ROOM.

arrangement called an "awning deck," over which the ship's boats are stowed, and fitted underneath with electric lamps. The ventilation of the ships throughout is amply provided for by fans, and the state-rooms are fitted with ventilating side-lights, which exclude the sea while admitting fresh air. The fittings throughout

are really superb, and the decorations highly artistic ; indeed, they must be seen to be fully appreciated. In each ship the midship-saloon is 60 × 57 feet, the full width of the ship, 10 feet in height, with a crystal dome in the roof. The decorations in this splendid banqueting-hall are in the Renaissance style. Bas-relief figures of tritons and nymphs in gold and ivory colour gambol around, and the ceiling is decorated in a corresponding style. It is brilliantly lighted by electricity. At either end there is beautifully carved oak cabinet-work. The revolving armchairs and couches are sumptuously upholstered. The library is on the promenade deck. It is fitted with book-cases containing a good supply of standard books ; writing-tables are arranged around it, divided by racks for stationery, and at each end there are luxurious couches.

The smoking-room is a cosy and handsome apartment. The woodwork is of rich, dark mahogany ; the walls are covered with embossed leather of the same tone, richly gilt. The panels are oil-paintings, representing the ships of the Middle Ages, and there are handsome couches upholstered in leather. The main entrance to the saloon, and the stairs leading to it, are of carved oak with white and gold ceilings. Both accord with the general magnificence of all the fittings.

On the promenade and upper decks there are a number of spacious state-rooms, luxuriously fitted up ; some of them have double bedsteads, wardrobes, armchairs, writing-tables, and couches. To add to their comfort, the appliances for heat, light, and ventilation are under the control of the occupant, who has but to move his hand to obtain light, or warm or cold air, and he can screen his window with a stained-glass shutter. All the other state-rooms are equally handsome and replete with conveniences. There are numerous bath-rooms and lavatories, in charge of special attendants, and a barber's shop fitted with electric motors to drive revolving hair-brushes !

The second cabin is in the after part of the ship. The saloon, state-rooms, baths and lavatories are far superior to those in an ordinary steamship, in fact, quite equal to what was formerly designated as first-class.

The whole of the free space of the upper deck is reserved for steerage passengers, who in stormy weather have the shelter of the deck above. The steerage is of unusual height ; baths supplied with hot and cold water, a smoking-room, separate rooms for families, electric lamps, perfect ventilation, and an elaborate system of lavatories, planned with a view to the utmost delicacy, are all luxuries never dreamt of in the old sailing ships, which

supplied emigrants with little more than bread and water, occupied thirty to sixty days on the voyage, and charged more passage-money than is now charged by the White Star Line for carrying them across in six days, with a liberal diet and all the comforts described! Unmarried women have their quarters aft, and are under the charge of a matron. No wonder that when the *Teutonic* appeared at the great naval review at Spithead, in 1889 (where the Emperor of Germany and the Prince of Wales inspected her) visitors were amazed at her size and the magnificence of all her fittings.

Each ship can accommodate 300 first, 170 second, and 850 third-class passengers, with an exceptionally large amount of cargo, in view of a consumption of coal of some 300 tons per day.

The speed of these two ships and that of the *Paris* and *New York* is practically the same. There was great rivalry between the *Teutonic* and *City of New York* in 1889-90, sailing as they did on the same day. On one passage they were in sight of each other nearly the whole distance. The *City of New York's* best time, Sandy Hook to Queenstown (2814 knots), was 5 days 19 hours and 57 minutes; but the *Teutonic* has made the western passage in 5 days 16 hours and 31 minutes, an average of 20·35 knots, and she has made 528 knots in one day going west, an average of 21·30 knots per hour. But the *Paris*, in October, 1892, beat both records, making the run west in 5 days 14 hours and 24 minutes (2782 knots), and 530 knots in one day going west. The *Majestic*, however, has averaged 20·41 knots on the southern route. All these records, however, have since been eclipsed by the *Campania* and *Lucania* of the Cunard Line. All racing, however, has been stopped by mutual agreement. So determined were the owners of the White Star Line to put it down that they discharged an old and faithful servant, simply, it is said, because he persisted in the practice contrary to orders. It should not be forgotten, however, that these records of time only are not conclusive as to speed, the difference between the northern and the southern route being fully 100 knots. There are recent records of 2778 knots in August, and 2894 in May, and allowance often has to be made for fog, head winds, heated bearings, or bad coals. Most ships now take Lieutenant Maury's "lane routes" to avoid collisions, following a northern route going west, and a southern route going east. In counting a day's run, too, it must be remembered that, with these fast boats, the day, going west, is about 24 hours 45 minutes actual time, but only about 23 hours 15 minutes going east. Speed, after all, is only a secondary

consideration. The most remarkable thing about the *Teutonic* and *Majestic* is their freedom from accidents. So far in five years only one accident has been reported, a collision with a fishing schooner in a fog, involving the loss of two lives, the others having been saved by the *Majestic's* lifeboats.

The question will naturally be asked, "Do such floating palaces pay?" So far as the White Star Line is concerned the public are kept in ignorance, for the managing owners issue no annual report, the shares being held by a small body of shareholders. The same remark applies to the International Navigation Company (Inman Line). The report of the Cunard Company for 1893 (and again this year) shows that they made no profit for that year, merely declaring a dividend for 1893 of 2 per cent. out of their underwriting account. The Hamburg-American Line paid no dividend, and the North German Lloyds only 3 per cent. These fast boats are run at an enormous cost. The *Teutonic*, for example, burns nearly 4000 tons of coal every round voyage, and her crew, including firemen and stewards, number fully 300 persons. Much costly nightwork has to be done, and she pays 36 cents, or 1s. 6d., per ton dock dues in Liverpool, every trip. The White Star Line, however, has been well patronised by passengers. The early Cunard boats, even such as the *Persia* and *Scotia*, rarely carried over 200 first- and second-class, and no steerage passengers; but the *Majestic* has carried 1593, made up of 586 first and second, and 1007 steerage, and on nine trips had an average of 1357; and the *Teutonic*, on seven trips, has averaged 1400. The competition, however, especially in winter, is very severe, and the ordinary rates are much lower than they were thirty years ago; while as to cargo, occasionally the current rates scarcely pay more than the cost of handling it. A bushel of grain is often carried by Atlantic steamships 600 miles for less than one cent, or one halfpenny sterling!¹

To show how wonderfully the passenger traffic has increased it is only necessary to quote the following figures:—

	Saloon.
In 1845 the Cunard boats (the only boats then running) carried west and east during the year to Boston and New York	2,700
In 1881 there landed in New York alone	51,229
„ 1886 „ „ „	68,742
„ 1889 „ „ „	96,686
„ 1890 „ „ „	99,189

¹ See Appendix No. XIII.

In 1891 there landed in New York alone	.	.	.	Saloon.
„ 1892	„	„	„	109,023
„ 1893	„	„	„	120,991
„ 1894 ¹	„	„	„	121,829
				92,561

And as many more doubtless went east.

The total number of alien passengers arriving in the United States from foreign countries was—

In 1840	.	.	.	.	.	84,060
„ 1845	.	.	.	.	.	114,371
„ 1850	.	.	.	.	.	310,004
„ 1854	.	.	.	.	.	427,833
„ 1870	.	.	.	.	.	379,854
„ 1880	.	.	.	.	.	622,252
„ 1883	.	.	.	.	.	764,303

In 1885 the method of counting was altered by excluding temporary visitors and adding immigrants arriving *via* Canada. The estimates for immigrants alone were—

For 1890	.	.	.	.	.	560,000
„ 1891	.	.	.	.	.	665,000
„ 1892	.	.	.	.	.	730,000

Since 1892 restrictions have reduced the number of immigrant arrivals. A return published in 1892, for ten years, 1881–91, gives the total number of passengers carried to New York by six lines as follows :—

1. North German Lloyd Company	.	.	.	.	738,668
2. Hamburg-American Company	.	.	.	.	525,900
3. White Star Line	.	.	.	.	371,193
4. Cunard Line	.	.	.	.	323,900
5. Inman Line.	.	.	.	.	322,930
6. Guion Line	.	.	.	.	237,836

—a return which caused no little surprise in British maritime circles. The Cunard Company, carried in addition, a considerable number to Boston.

The mails carried have increased at a still more rapid rate. From 1840 to 1870 the number of bags averaged about 150 to 200, but the *Majestic* has carried on one occasion 1672 bags and baskets. The British Post Office no longer pays any subsidies to North Atlantic steamships, but pays for the mails by weight, selecting the fastest steamships from Liverpool twice a week, and

¹ See Appendix No. III.

also sends a small number *via* Southampton, when specially directed. In 1893-4 the British Government paid to Atlantic steamships, for the carriage of mails, £105,500 in all, of which the White Star Line probably earned about one-half. The United States Post Office is very illiberal in such matters. While it pays to United States steamships \$1.60 per lb. for letters, and 8 cents per lb. for other mail matter, to British steamships it only pays 44 cents per lb. for letters and cards, and 4½ cents per lb. for other mail matter. Under this arrangement it paid to the White Star Line, in 1893-4, a sum of \$47,176, or nearly £10,000 sterling. It has now agreed, however, to pay a large subsidy to the International Navigation Company, or the American Line, for the carriage of United States mails once a week to Southampton; and in future only letters, etc., specially directed will be forwarded from the United States by British or German boats.

The United States Superintendent of Foreign Mails issued the following statement showing the average apparent time, and the quickest trip of each steamship carrying United States mails from New York to London *via* Queenstown, for 1892:—

	Average in Hours.	Quickest.
Teutonic	175'5	167'3
Majestic	178'8	170'4
City of New York	179'4	171'3
City of Paris	182'4	175'6
Umbria	184'5	173'2
Etruria	184'7	176'0

The *Celtic* was sold to the Thingvalla Line in 1893, and is now known as the *Amerika* under the Danish flag.

The White Star Line receives from the British Admiralty an annual sum of £14,659 10s. as a retainer for the *Teutonic* and *Majestic*.

The best-known captains on this line have been Perry, Gleadell, Parsell, Jennings, Irving and Kennedy—all very able and popular men. Captain Parsell now commands the *Majestic* and Captain Cameron the *Teutonic*.

Mr. Thomas H. Ismay retired from the firm in 1892, although still retaining his entire interest and position in the line, but not before he had handed over the munificent sum of £20,000 sterling as a nucleus for a fund for the support of aged and indigent merchant seamen, to commemorate the occurrence of his fiftieth birthday, in the Jubilee year of Her Majesty Queen Victoria, in 1887.

Mr. W. S. Graves joined the firm in 1881 and the two elder sons of Mr. Ismay in 1891.

WHITE STAR LINE FLEET.

No.	Name of Ship.	Tons.	I.H.P.
1	Majestic	9,861	16,000
2	Teutonic	9,686	16,000
3	Germanic	5,008	5,000
4	Britannic	5,004	5,000
			Nominal H.P.
5	Adriatic	3,888	600
6	Cevic	8,315	
7	Bovic	6,583	600
8	Tauric	5,728	600
9	Nomadic	5,749	600
10	Runic	4,649	520
11	Cufic	4,639	520
	JAPAN AND CHINA LINE.		H.P.
12	Oceanic	3,808	500
13	Belgic	4,206	
14	Gaelic	4,206	
	NEW ZEALAND LINE.		
15	Doric	4,784	
16	Ionic	4,753	
17	Coptic		
18	Gothic	7,220	

CHAPTER XI.

THE EASTERN STEAM NAVIGATION COMPANY.

IN 1853 the British Admiralty advertised for tenders to carry the mails to India and Australia, and a number of gentlemen of great wealth, and others of scientific attainments formed this company, with a capital of £1,200,000, and sent in a tender ; but it was not accepted. Some of the directors, unfortunately, consulted Mr. Isambard K. Brunel, a very able and daring civil engineer, but fifty years ahead of his time. He recommended the construction of a monster iron steamship, to run direct to Ceylon at an average speed of 15 knots, *and to carry coals enough to take her out and home* without stopping to re-coal, making the passage each way in thirty days, with smaller branch boats to Madras, Calcutta, Hong-Kong, and Australia. It was one of Brunel's "grand ideas," and although Mr. Atherton, a naval architect, said it could not be done, the directors commissioned Brunel to design such a ship. This he did in conjunction with Mr. Scott-Russell, of Millwall, a celebrated shipbuilder. She was to be 692 feet long on deck, 83 feet beam, and 58 feet deep, 22,000 tons old, or builders' measurement, 19,000 tons new measurement gross, and 13,000 net ; to be built on the cellular principle, with 30,000 plates and 3,000,000 rivets ; capacity for 18,000 tons of cargo and coals, and accommodation for 800 first, 2000 second, and 1200 third-class passengers. She was to have five splendid saloons, six masts, and twenty boats ; to be propelled by a pair of paddle engines of 1000 H.P. nominal, and 5000 indicated ; four cylinders 74 inches in diameter and 14 feet stroke, and a pair of screw engines, 1600 H.P. nominal and 6000 indicated, with cylinders 84 inches in diameter and 4 feet stroke.

The design was accepted, and contracts made with Mr. Russell for the hull and paddle engines, and with James Watt & Co., of Birmingham, for the screw engines. Mr. Russell decided to build her at Millwall, on the Thames, *parallel with the river* (a mistake),



"GREAT EASTERN."

and she was commenced on the 1st May, 1854.¹ She was ready for launching on *iron* ways (another mistake) on the 3rd November, 1857. Crowds of scientific and naval men attended, but she refused to budge. Stationary engines tightened chain cables, when she moved $3\frac{1}{2}$ feet one end and 7 feet at the other, and then the chains snapped asunder. After employing hydraulic rams, with a pressure of 1300 lbs. to the square inch, and 3-inch chain cables, injuring several men, and spending £120,000 (\$600,000), she was finally launched on the 31st January, 1858. A permanent stone graving-dock could have been built for the money, and the ship floated out of it free of cost, as the *Great Britain* was at Bristol in 1843. Brunel's estimate of the cost of launching was £14,000! So much for engineers' estimates. It is only fair to say, however, that Mr. Russell is understood to have opposed iron ways. She was to have been called the *Leviathan*, but she was christened the *Great Eastern*. Her exact tonnage was 18,915 tons gross, and 13,344 net. The cost of launching had exhausted the company's funds, and she lay unfinished for twelve months. At length a new company was formed, the "Great Ship Company," to which she was sold for £160,000, but it was September, 1859, before she was completed. Her actual cost, when finally ready for sea, was about £1,000,000 sterling, or \$5,000,000.

After making a trial trip to Holyhead (during which the explosion of a superheater killed six men), she proceeded to Southampton, where Captain Harrison, her commander, was drowned by the upsetting of a boat, and it was not until the 17th June, 1860, that she started for New York with only 36 passengers. She arrived there on the 28th, but her greatest speed was only $14\frac{1}{2}$ knots, and her best day's run only $333 = 13^{\circ}59$ per hour, and her average on the passage only 300, or $12^{\circ}24$ knots. Great crowds visited her there, and \$70,000 (£14,000) were received for admission fees over and above all her expenses. She returned to Milford, and as neither sufficient goods nor passengers could be procured for India, she lay there until the 1st May, 1861, when she again started for New York with 100 passengers; but her maximum speed was no greater than on the previous trip, proving that she had not sufficient power to propel her immense hull at the estimated speed. On her return she was chartered by the British Government to carry troops to Quebec, under the command of Captain Kennedy. She was designed to carry 10,000, but the Government limited the number to 2528, and she also carried 40 civilians. Having landed

¹ Scott-Russell's pamphlet.

them in July, she left Quebec August 6th, and arrived at Liverpool on the 15th. Early in September she left Liverpool for New York, and on the 12th and 13th fell in with an equinoctial gale, her rudder was damaged and became useless; she fell off into the trough of the sea, rolled frightfully, pitching a cow through a skylight into the grand saloon, terrifying the passengers, and had to put back to Queenstown. From this out, with the exception of one voyage to New York for a French company, she was devoted to cable laying, at which she proved a great success. She laid two of the Atlantic cables in 1865 and 1866, under the command of Captains Anderson and Hall. In 1868 she laid a cable between Brest and Duxbury, near Boston; in 1870 one between Aden and Bombay; and in 1873 and 1874 two between Valentia and Newfoundland; but she seems never to have paid her way. As a commercial venture she was a ruinous failure, and only proved that a clever civil engineer, with grand ideas, is not always a safe guide as a naval architect.

She was several times sold, always at diminishing prices, and at last for about £16,000, to parties who exhibited her on the Clyde, and afterwards broke her up in the Mersey. Brunel's ideas as to size, however, are in a fair way of being carried out, for we now see ships of 12,950 tons, 620 feet long, running between Liverpool and New York, but with 30,000 H.P. indicated instead of the 11,000, which was all the *Great Eastern* had. He admitted that the paddles were a mistake and would have to be removed. The anxiety and worry attending her launch is said to have hastened his death, which occurred on the 15th September, 1859.

CHAPTER XII.

THE ANCHOR LINE.

THE Anchor Line was commenced in 1856 by Messrs. Handyside & Henderson, of Glasgow, with the steamship *Tempest* to New York,¹ and a couple of small boats running between Glasgow, Quebec and Montreal, one of which, the *United Kingdom*, was wrecked on the Bird Rock reef in the St. Lawrence. They also established, about the same time, a line between Glasgow and various ports in the Mediterranean. But in 1865 they transferred their American line to New York, despatching a boat fortnightly. Since then the service has been gradually increased to a weekly line, and during summer to twice a week, as the trade demanded. They have also greatly developed the trade between various ports in Italy, Sicily, Malta, Trieste, Naples, etc., and New York, and latterly they have extended their operations to India, *via* the Suez Canal. Their boats have gradually increased in size and power from 1000 tons and 100 H.P. nominal to 5495 tons and 720 H.P. They are specially designed for large carrying capacity, and some of them have good speed. At one time the line consisted of no less than thirty-six ships. The *Anchoria*, for example, is 4157 tons gross (408 × 40 × 34) and 617 H.P. nominal; the *Bolivia* is 4050 tons (400 × 40 × 33); the *Ethiopia* is 4005 tons (402 × 40 × 33), 720 H.P.; the *Circassia* is 4272 tons² (399 × 42 × 33), 600 H.P.; the *Devonia* is 4270 tons (400 × 42 × 33), 600 H.P.; the *Victoria* is 3358 tons (360 × 40 × 31·9), 480 H.P.; and the *Furnessia* is 5495 tons (445 × 44·8 × 34·5), 600 H.P. The early boats were all built on the Clyde, but most of the above named were built at Barrow-in-Furness, Lancashire.

When the Inman Company threw up the *City of Rome*, also built at Barrow, in 1881, she passed into the Anchor Line, running

¹ The *Tempest* sailed 26th February, 1857, and was never heard of again.

² *Circassia* was the first boat fitted with a refrigerator (in 1879).

between New York and Liverpool, and latterly to Glasgow. She is a magnificent ship, 8144 tons gross, of great length ($560 \times 52 \times 37$), and 11,890 I.H.P. Her boiler power at first being insufficient, she did not come up to the speed guaranteed by her builders, but it has since been increased; and although not a match for the *Etruria* she is very fast, quite equal to the *Servia*. She has six cylinders, three of 46 inches, and three of 86 inches diameter, with six feet stroke. She made 18·23 knots on her trial trip, and her best time between New York and Queenstown was 6 days 21 hours 4 minutes. As showing the perfection to which ships' compasses have been brought, the accident to this ship may be quoted. The New York steamships bound to Queenstown shape a course for the Fastnet, a little pinnacle rock with a lighthouse and signal-station on it, near Cape Clear, in the S.W. of Ireland. On the 8th June, 1890, the *City of Rome*, during a dense fog, actually struck this little rock, destroying twenty feet of her bow; her bulkheads saved her; she got off and reached her destination.

The company has not escaped other more serious accidents, some, unhappily, attended with terrible loss of life. Thus in October, 1868, the *Hibernia* broke her screw-shaft 600 miles from Ireland, filled through the shaft tunnel and sank with the loss of many lives. In October, 1870, the *Cambria* was wrecked on the island of Innstrahull (Ireland), and only one man escaped out of 170. In November, 1890, the *Ethiopia* broke her shaft and was towed to Ireland by the *Oregon*, and in June, 1894, the same boat struck an iceberg and stove in her bows in a fog; her bulkheads saved her, and she reached Glasgow eight days later. Then one of the most terrible accidents of modern times happened to the *Utopia* on the 17th March, 1891, when bound from Naples to New York with 800 Italian emigrants. Entering Gibraltar Bay in a heavy gale she struck the ram of H.M.S. *Anson*, and immediately sank with a loss of 562 lives, besides two brave men of the *Immortalité*, drowned in a heroic effort to save lives. The *Utopia* was raised in the following July under the direction of Mr. Armit. Captain McKeague was tried and censured for grave error of judgment.

On the 24th August, 1892, the *Anglia* capsized near the mouth of the river Hooghly (India), and twelve lives were lost. The *Trinacria*, a Mediterranean boat, was lost on the coast of Portugal with thirty-seven of her crew and four passengers; and in October, 1893, the *Roumania*, bound from Liverpool to Bombay, was wrecked on the same coast, near Peniche, 50 miles north of Lisbon, when, out of fifty-five passengers and a crew of sixty-seven, only nine

persons were saved. The company still owns a fine fleet of ships, which are managed by Henderson Brothers, Glasgow. William Henderson, one of the founders of the line, died on the 8th April, 1895.

ANCHOR LINE FLEET.

	Tons gross.
1. City of Rome	8,144
2. Furnessia	5,495
3. Belgravia	4,977
4. Circassia	4,272
5. Devonian	4,270
6. Anchoria	4,157
7. Bolivia	4,050
8. Ethiopia	4,005
9. California	3,410
10. Victoria	3,358
11. Scotia	3,287
12. Britannia	3,069
13. Hesperia	3,027
14. Alsatia	2,773
15. Elysia	2,714
16. India	2,477
17. Australia	2,252
18. Italia	2,245
19. Caledonia	2,151
20. Olympia	2,051
21. Columbia	2,030
22. Assyria	2,023

And thirteen smaller boats in the Mediterranean trade.

CHAPTER XIII.

THE ROYAL ATLANTIC STEAM NAVIGATION COMPANY.

THE "Royal Atlantic Steam Navigation Company," better known as the "Galway Line," was one of the most conspicuous failures known in the history of the trade. A number of English and Irish gentlemen, headed by a patriotic Irish priest living at Galway, none of whom had any experience of the business, in January, 1859, proposed to the Government to carry the mails from Galway to Boston or New York for a subsidy of £3000 per round voyage. There being no cable then working, the attraction they offered was an undertaking "to carry telegraph messages from the United Kingdom to British North America and the United States in six days, *via* Galway and St. John's, Newfoundland." Certain influences having been brought to bear on the Government, a contract was entered into on the 21st April, 1859, based on this proposal, the service to commence in June, 1860. To carry it out the company contracted for four boats, each of 2800 tons gross ($360 \times 40 \times 32$), with engines of 850 H.P. nominal, guaranteed "to make 20 statute miles per hour (about $17\frac{1}{2}$ knots) in smooth water, on a consumption of 8800 lbs. of coal per hour," equal to about 95 tons per day. Messrs. Palmer, of Newcastle, built two, the *Hibernia* and *Connaught*, for £95,000 each, and Messrs. Samuelson, of Hull, the other two at £97,500 each. But on the trial of the *Connaught* the Government inspector reported that "her speed was only about 13 knots." None of the vessels were delivered within the contract time. The company therefore chartered the *Parana*, which sailed from Galway on the 27th June, 1860. She occupied 7 days $13\frac{1}{2}$ hours in reaching St. John's, and 11 days $17\frac{3}{4}$ hours in reaching New York.

The *Connaught* sailed on the 11th July for Boston direct, but was $22\frac{1}{2}$ hours over the contract time in arriving. On her second voyage, in October, she was 7 days $20\frac{1}{2}$ hours to St. John's, and was totally wrecked when approaching Boston. The second

ship, the *Hibernia*, fell in with a severe gale between the Tyne and Galway, and was so badly strained that she never entered the service at all, while the third ship, the *Columbia*, which sailed from Galway on the 9th April, 1861, was badly disabled by ice, and occupied 10 days 7½ hours to St. John's, and 17 days 20½ hours to Boston. To replace the *Connaught* the *Prince Albert* was chartered, and in February, 1861, the company bought the *Adriatic*, formerly of the Collins Line, and she was the only boat that kept the contract time. She made the run from Galway to St. John's in 6 days, and returned in 5 days 19½ hours,¹ when one of her cylinders burst and killed her engineer. But having within six months lost one ship, while a second was disabled by a storm, and a third by ice, the company found it impossible to raise fresh capital, and had to abandon the undertaking, and terminate their contract in May, 1861. The shareholders were reported to have lost in eighteen months nearly all, if not the whole, of their capital. The ships were mortgaged to Overend, Gurney & Co., London bankers, whom they helped to ruin. Such are the natural results when men embark in a business which they do not understand.

¹ Report of Parliamentary Committee.

CHAPTER XIV.

THE NATIONAL STEAM NAVIGATION COMPANY.

THE success of the Inman and Allan Lines led to many similar undertakings. In 1863 a number of Liverpool merchants and shipowners established the "National Steam Navigation Company," with a capital of £700,000. The original intention was to run the boats between Liverpool and the Southern States after the close of the Civil War; but as this was delayed, and the ships were ready, they sent them to New York to compete with the Cunard and Inman companies. Their first boats were the *Louisiana*, 3847 tons, 300 H.P. (afterwards re-named the *Holland*); the *Virginia*, 4310 tons, 400 H.P. (afterwards re-named the *Greece*); and the *Pennsylvania*, 4276 tons, 400 H.P. (afterwards re-named the *Canada*), all screws. They were intended chiefly for goods and steerage passengers. Being of large size and low power they were not as fast as either the Cunard or Inman boats. In 1864 they added the *Erin*, the *Queen*, 4457 tons, 420 H.P., and the *Helvetia*, 4588 tons, 420 H.P. At the conclusion of the Civil War, in 1865, they found ample employment for the six boats in the New York trade, which was rapidly increasing. In 1865 they added the *Scotland*, and in 1866 the *England*, 4898 tons, 420 H.P.; the *Denmark*, 3724 tons, 350 H.P.; and the *France*, 4281 tons, 400 H.P.

In 1867 some of these ships were chartered by the British Government for service as transports in the Abyssinian War.

In 1868 they were the first to adopt compound engines in the New York trade, building the *Italy*, 4169 tons, 500 H.P. In 1870-1 they built the *Egypt*, 4669 tons, 600 H.P.; and the *Spain*, 4512 tons, 600 H.P. The two last named were built by the Liverpool Shipbuilding Company, and by Messrs. Laird, of Birkenhead. Both were very fine ships and much faster than their earlier boats. The *Spain* has a record of 9 days 1 hour 17 minutes from Queenstown to New York, and 8 days 19 hours

53 minutes going east. In 1873 the *Egypt* landed in New York the large number of 1767 steerage passengers, probably the largest number ever carried to New York in a British ship. They also established a fortnightly line between London and New York.

In 1883 they built on the Clyde a magnificent ship of larger tonnage and great speed, the *America*, for the ever popular Captain Grace. She was 5528 tons (432×51) and 7354 H.P. indicated, with three cylinders, one of 63 and two of 91 inches in diameter, with $5\frac{1}{2}$ feet stroke. On her trial at the measured mile she made 17.8 knots. Her best trip was made in 6 days 14 hours 18 minutes. Soon after placing her on the route they accepted a tempting offer for her from the Italian Government, who wanted her for a transport. She had previously made one trip to India with British troops.

In 1891 the company built two boats of smaller power, the *Europe* on the Tyne, 5302 tons, 600 H.P. nominal ($435 \times 46.4 \times 33$), and a second *America*, at Dundee, 5158 tons, 600 H.P. ($435 \times 46.3 \times 33$).

One of this company's ships, the *Greece*, was the first to carry fresh meat from New York in refrigerators (in 1876), and the same ship was the first to carry live cattle (in 1877). The company's ships paid very well for some years, but ultimately the restrictions placed upon the immigrant business by the United States Government led them to abandon the passenger service, while the Liverpool freight business was entirely unremunerative. The company has therefore transferred the ships to London, between which port and New York they now run weekly with freight and live stock. In one year these ships landed at New York 33,494 steerage passengers, but only 2442 saloon.

The company has not escaped serious disasters, although for many years they could boast that they had not lost a passenger by accident or negligence at sea. In April, 1866, a boy on board the *England*, carrying 1200 steerage passengers, developed a case of small-pox when three days out, and she had to run to Halifax with hundreds of passengers sick, dead and dying. The *Scotland* was sunk near Sandy Hook (New York), where she still lies with a lightship over her. In the winter of 1889-90 the *Erin* left New York and was never heard of again. In July, 1890, the *Egypt* was burnt at sea, the fire having commenced spontaneously among bales of cotton. The passengers and crew were all rescued by a passing ship, and in 1894 the *Helvetia* was abandoned off Cape Finisterre; her passengers and crew were landed at Gibraltar, April 26th.

NATIONAL LINE FLEET.

No.	Name of Ship.	Tons.	Nominal H.P.
1	America	5,158	600
2	Europe	5,302	600
3	England	4,898	420
4	Spain	4,512	600
5	The Queen	4,457	420
6	Greece	4,310	400
7	France	4,281	400
8	Denmark	3,724	350

CHAPTER XV.

THE GUION LINE.

MESSRS. WILLIAMS & GUION, of New York, long owned a fine fleet of sailing packet ships, from 900 to 1800 tons, known as the "Blackball Line," specially built to carry emigrants from Liverpool to New York. In summer they often carried 1000 per week. They had a branch house in Liverpool, Guion & Co., managed by Stephen B. Guion.

In 1863, finding it impossible to compete successfully with the iron screw steamships, but yet still doubtful of their permanent success, they entered into an arrangement to supply the Cunard and National Lines with emigrants. But in 1866 they started a steamship of their own, the *Manhattan*, 3182 tons, 250 H.P. nominal ($335 \times 42 \times 27.8$), an iron screw, built on the Tyne, and still running as the *City of Lincoln*. She was the pioneer ship of the "Liverpool and Great Western Steamship Company," better known as the Guion Line.

As the ships were all built in Great Britain they could not carry the United States flag, but taking advantage of the technical decision of the Court of Queen's Bench, already quoted in the case of the Inman Line, they have always carried the British flag although owned chiefly, if not altogether, by Americans. The company built in rapid succession the *Minnesota*, *Nebraska*, *Colorado*, *Idaho*, *Chicago*, and *Nevada*, each of about 3500 tons gross and 300 to 400 H.P. nominal, forming a weekly line. They were specially designed to carry large cargoes of goods, and about 1000 emigrants each, but had not sufficient power to compete with the Cunard boats for speed. In 1870 they built two boats on the Tyne of much greater power, the *Wisconsin*, 3700 tons and 600 H.P. nominal ($366 \times 43 \times 26.6$), and the *Wyoming*, 3729 tons and 600 H.P. ($366 \times 43 \times 26.6$). The *Wisconsin* has a record of 9 days 20 hours 37 minutes, Queenstown to New York, and 8 days 12 hours 15 minutes going east, the *Wyoming* of 9 days 17 hours

32 minutes going west, and 8 days 6 hours 30 minutes going east, and the *Nevada* of 9 days 20 hours 52 minutes going west, and 8 days 7 hours 25 minutes going east. In 1873 they added the *Montana*, and in 1874 the *Dakota* ($400 \times 43.9 \times 40.9$). In 1870 they stood third in the number of steerage passengers landed in New York from Liverpool, 27,054, but they only carried 1115 saloon.

In 1874 commenced that long depression which seriously affected every trade in the world, and especially the steamship trade. The Guion Company sold several of their ships. The *Chicago* was wrecked on Daunt's Rock near Queenstown, in January, 1868; the *Colorado* was sunk by collision in the Mersey in December, 1873; the *Dakota* was wrecked on the Welsh coast in May, 1877, and the *Montana* on the same coast in March, 1880.

In 1879, when a partial revival occurred, they ordered a much larger and faster boat than they had hitherto ventured upon, and gave the contract to John Elder & Co., of the Fairfield Yard, Glasgow. William Pearce was then at the head of this firm, and hardly known beyond the Clyde, but this ship made him famous and was the forerunner of all the Atlantic "greyhounds." This was the *Arizona*. She had unusual length and great power, 5164 tons, 1200 H.P. nominal, and 6300 indicated ($450 \times 45 \times 35.7$), with three cylinders, one of 62 inches diameter and two of 90, with $5\frac{1}{2}$ feet stroke. She astonished the world, for she made 17 knots on her trial trip and reduced the time from Queenstown to New York to 7 days 7 hours 48 minutes, and the eastward to 7 days 3 hours 38 minutes. She, however, had a very narrow escape, for in November, 1879, in a dense fog she ran into an iceberg and completely crushed in her bows; her bulkheads saved her, and she returned to St. John's, Newfoundland, for temporary repairs.

This ship was such a success that the Guions gave Mr. Pearce an order for a still larger ship, and in 1881 he produced the *Alaska*, 6932 tons, 1800 H.P. nominal, and 10,000 indicated ($500 \times 50 \times 38$), with great length and very fine lines. Her engine has three cylinders, one of 68 inches diameter, and two of 100 with 6 feet stroke. She proved still faster, making 18 knots on her trial trip, and was the first to bring the time from Queenstown to New York under 7 days. In 1882 she reduced the time of the eastward passage to 6 days 18 hours 37 minutes, and in 1883 she reduced the time of the westward passage to 6 days 21 hours 40 minutes. For a short time she held undisputed sway as the fastest ship in the world, and of course commanded a preference

from most American travellers, especially as she was in reality owned chiefly by Americans.

But only for a short time. The craze for extreme speed had now fairly set in, and competition was very keen. Few expected that a mere freight line like the Guion would beat the Cunard, the Inman, and the White Star boats. William Pearce became the prince of naval architects, but death snatched him away too soon from the scene of his triumphs. Flushed by their success the Guions ordered from him another boat, still larger and faster than the *Alaska*. This was the *Oregon*, 7375 tons and 13,300 H.P. indicated (501 × 54). Her engines also had three cylinders, one of 70 inches diameter and two of 104 inches with 6 feet stroke. She made 18·3 knots on her trial trip. In 1883 she eclipsed the *Alaska* and, it is said, reduced the time from Queenstown to New York to 6 days 10 hours 10 minutes. The New York partner, however, made heavy losses in some speculations outside the steamship business, and in consequence she passed into the hands of the Cunard Company in June, 1884, and after a very brief career was sunk off Long Island, 11th March, 1886, by collision with a wooden schooner! The passengers and crew were, however, all saved. The *Alaska* lost her rudder, but reached New York in a novel manner. Instead of being towed in she towed the *Lake Winnepeg*, the latter making the course and acting as a temporary rudder, for which she was awarded a fair salvage.

The death, in Liverpool, on 19th December, 1885, of Stephen B. Guion, who had been the life of the concern from the first, led to the winding-up of its affairs. A weekly line, consisting of the *Alaska*, *Arizona*, *Nevada*, *Wisconsin* and *Wyoming*, was maintained for some time after his death; but owing to the extreme depression in freights, and the restrictions on immigration enacted by Congress, they did not pay their running expenses, and all the boats were laid up for sale. In the ten years 1881-91 they carried to New York 237,836 passengers. James Price, a sturdy Welshman, was long the commodore of the fleet. George S. Murray was the energetic and watchful captain of the *Alaska*. Captain Jones was dismissed from the *Arizona* after the accident, and is said to have died of grief soon afterwards.

CHAPTER XVI.

THE DOMINION LINE.

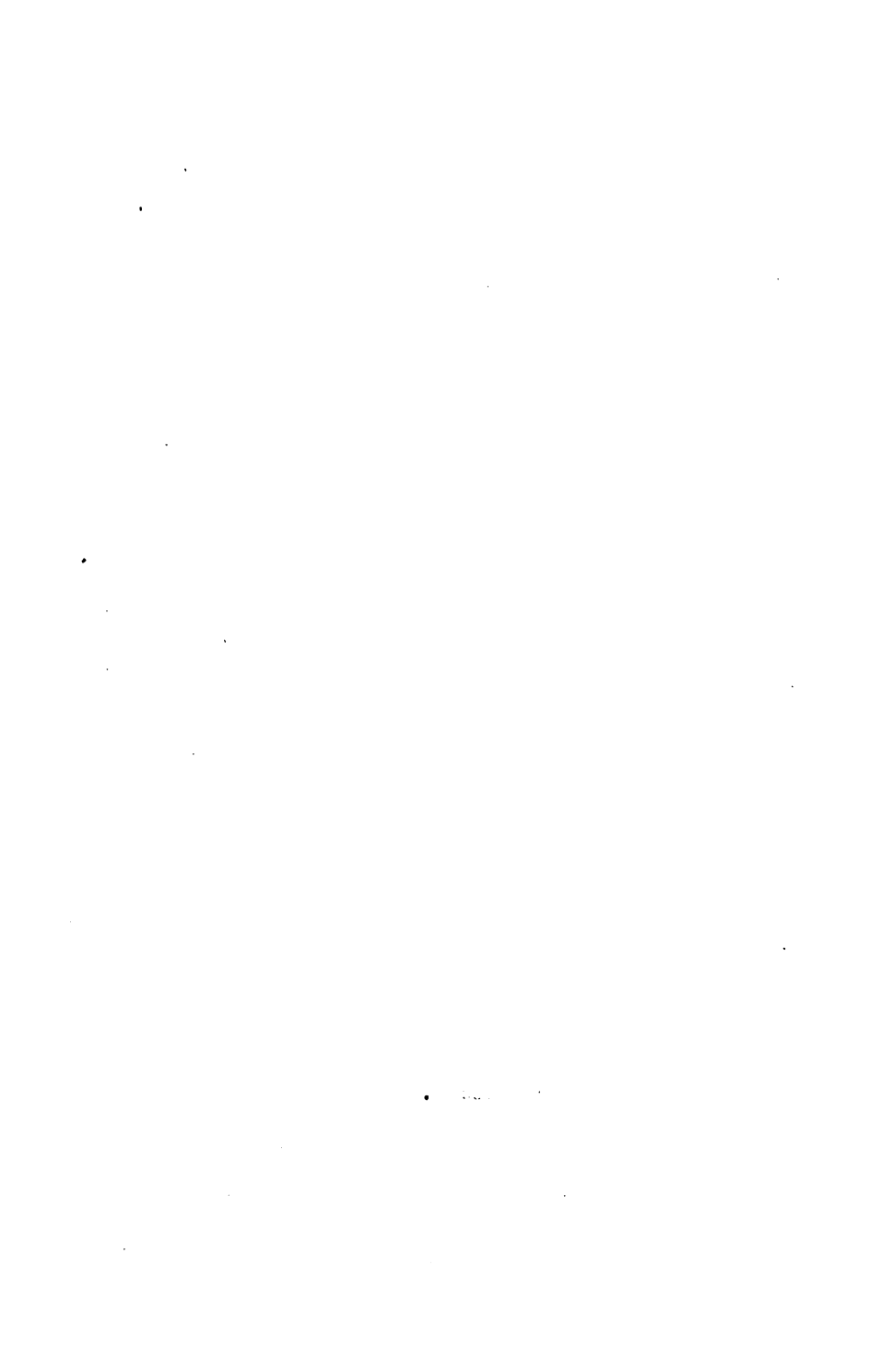
FOR many years after the introduction of iron screw steamships to the Atlantic trade it was not supposed that they could compete successfully with sailing ships in the carriage of such bulky goods as raw cotton, but in 1870 a number of merchants engaged in the New Orleans trade with Liverpool resolved to make the attempt, and formed the Mississippi and Dominion Steamship Company, Limited, under the management of Messrs. Flinn, Main & Montgomery, of Liverpool. They were to run to New Orleans in winter (calling on the outward voyage at Bordeaux, Lisbon and Havana), and to Quebec and Montreal in summer. Their first boats were the *St. Louis*, *Vicksburg* and *Memphis*, all under 2000 tons gross, built in 1870. In 1871 they built the *Mississippi*, 2129 tons (now the *Sicilia*), and in 1872 the *Texas*, 2822 tons.

After a time the directors abandoned the New Orleans trade and confined themselves to the Canadian trade, sailing to and from Portland, Maine, in winter, and thus the boats became known as the Dominion Line.

Gradually they sold the smaller boats and substituted larger ones, designed to carry large cargoes, with good accommodation for passengers, and fitted with compound engines of moderate power. Being of less speed at first than the Allan boats, they were not as popular with passengers, but latterly they have become powerful competitors, both for goods and passengers, and two of their boats are about a match for the popular *Parisian* in point of speed. In 1874 they built the *Dominion*, 3176 tons, 350 H.P. nominal ($335 \times 38\cdot4 \times 32\cdot5$), and the *Ontario*, a sister ship, at Dumbarton; in 1879 the *Montreal*, 3300 tons, 375 H.P. ($320 \times 39 \times 25$); in 1880 the *Toronto*, 3316 tons, 375 H.P. ($329\cdot5 \times 39\cdot3 \times 25\cdot2$), at Whiteinch, and the *Ottawa*, a sister ship; and they



"VANCOUVER."



bought from the Inman Company the *City of Dublin* (re-named the *Quebec*), and the *City of Brooklyn* (re-named the *Brooklyn*), 2911 tons and 450 H.P. nominal. In 1882 they built the *Sarnia*, 3694 tons, 500 H.P. (360 × 40 × 32), at Whiteinch, and in 1883 the *Oregon*, 3672 tons, a sister ship, two very fine boats of larger size and power, with midship saloons and state-rooms. But the line had its full share of misfortunes. The *Vicksburg* stranded below Green Island, in the St. Lawrence, in 1874, and after a heavy repair, struck field ice in the following spring (30th May) and sank with 40 to 50 of the passengers and crew, including her captain. The *Quebec* ran into two sailing ships when leaving Quebec in 1876, and, after a long Admiralty lawsuit, had to pay some \$30,000 damages, besides heavy costs. The *Ottawa* struck the ground, about 50 miles above Quebec, on the 21st November, 1880, could not be rescued, and gradually broke up. The *Sarnia* went ashore on Rathlin Island, but came off and was repaired; and the *Brooklyn* was totally wrecked on Anticosti. Happily there was no loss of life in any but the *Vicksburg*.

Nothing discouraged, however, in 1883 the company contracted with Messrs. Connal & Co., of Glasgow, for a magnificent ship, of over 5000 tons, with good speed, but before she was completed sold her to the Inman Company, to replace the *City of Rome*, and she was known as the *City of Chicago*. They at once had built by the same firm the *Vancouver*, launched in 1884. She is a very fine and fast ship, 5149 tons gross and 2859 net (430 × 45 × 33); she had powerful compound engines of 1000 H.P. nominal, giving her an average speed of fully 14 knots at sea, and placing her nearly on a par with the *Parisian*, their best passages showing only a difference of three or four hours. Having splendid accommodations amidships she soon became a great favourite with passengers; and in August, 1890, she carried 201 saloon, and in April 1893 she landed no less than 1340 in Halifax, 78 cabin and 1262 steerage. She has, however, met with several accidents. In August, 1890, in a fog near Belle Isle, she struck an iceberg, but got clear with little damage; and in November her popular commander, Captain Lindall, was swept overboard by a sea, together with a quartermaster, and both were drowned; and in November, 1894, her screw slipped when entering Lough Foyle, and she grounded on Lyle's Bank, but sustained no damage, and was towed to Liverpool. As she never realised a rate of speed proportionate to her great power, in 1893 Messrs. Harland & Wolff gave her new engines and boilers of the latest type (triple cylinders), which, although of less nominal power than the original

ones, and consuming much less coal, gave her quite as much speed. So rapidly do marine engines become obsolete.

Misfortunes, however, continued. In August, 1889, the *Montreal* was totally wrecked in a fog on the island of Belle Isle, but passengers and crew were saved. In 1890 the *Idaho*, a chartered boat, was wrecked on Anticosti, with a very valuable cargo of grain, cheese and cattle, but no lives were lost.

In 1891 the company launched from the yard of Harland & Wolff, Belfast, a very fine new ship, the *Labrador*, 4737 tons gross, 2998 net ($401 \times 47 \times 28.3$), 650 H.P. nominal, 3800 indicated. Although of less power she exceeds the *Vancouver* in speed, while carrying a very large cargo of 5700 tons. She has some novel arrangements, such as pipes for conveying fresh water to cattle, automatic ventilators, open in all weathers, and others supplying fresh air to the 'tween decks by fans; steam pipes to each compartment for extinguishing fire, and refrigerating machinery for fresh beef, fruit, eggs, etc. In the steerage the canvas beds in framework of wood can be folded up by day, and she is lighted throughout by electricity. So far she has been very successful and has made some remarkable passages. In May, 1894, she averaged 365 knots per day from Moville to Rimouski, or 15 knots per hour. In August she ran from Moville to Rimouski in 6 days 8 hours, the quickest passage ever made; and in December she ran from Moville to Halifax in 6 days 12 hours, averaging 348 knots per day, great work for a boat of such small power.

In addition to the Liverpool line they now run one between Montreal and Avonmouth (Bristol); and in 1893 the *Nevada*, 3617 tons, was bought at a very low price (said to be only £4500) for this line from the Guion Company and re-named the *Hamilton*. All their boats, except the *Vancouver*, carry cattle, sheep and horses, and latterly, to prevent a useless competition, the Allans agreed to share the small mail subsidy with the company, the *Vancouver* and *Labrador* carrying the mails for two weeks out of every five.

The *Sarnia* has been particularly unfortunate. In March, 1893, when bound from Liverpool to Halifax with 700 passengers, in long. 44° W., the bearings of the after crank-shaft broke; they were temporarily repaired at sea in six days, and she reached Halifax without assistance. In August of the same year she broke her shaft and was towed 1000 miles to Queenstown by the Allan steamship *Monte Videan*, and in December 22nd, 1894, she lost her rudder in lat. 55° N., and long. 12° W. After drifting for several days, helpless, she was towed to Innstrahull by the Allan steamship *Norwegian*, and thence to Belfast by tugs. In May,

1894, the *Texas* ran ashore near Cape Race in a fog and became a total wreck, but Captain Hunter was absolved from all blame by a court of inquiry. As a set-off against all these losses the *Oregon* fell in with the *Ethiopia*, of the Anchor Line, disabled and towed her to Ireland, and the *Texas* towed the Allan steamship *Sardinian* to Liverpool; the latter ship having lost her rudder, and the company thus earned considerable salvage.

In the fall of 1894 Messrs. Flinn, Main & Montgomery, the managers, resigned. On the 12th December, to the surprise of everyone outside the shareholders and directors, it was announced that all the boats had been sold to Messrs. Richards, Mills & Co., of Liverpool, at a great sacrifice. The original £20 shares (afterwards reduced to £15) realised only £1 16s. 6d. per share, the buyers assuming the company's liabilities. There are besides debentures to the extent of £78,000. Thus over £400,000 sterling appear to have been lost by the extreme depression in ocean freights and other losses.

CHAPTER XVII.

THE BEAVER LINE.

IN the year 1867 several wealthy Montreal merchants decided to form a company to run a line of fast iron sailing ships between Liverpool and Montreal, and the result was seen in the "Canada Shipping Company," known as the Beaver Line, from the flag the ships carried. They built five powerful, fast ships on the Clyde. The first was the *Lake Ontario*, 1068 tons, followed by the *Lake Erie*, 938 tons, the *Lake Michigan*, 900, and the *Lake Huron*, 900 tons. The fifth was the largest and fastest, the *Lake Superior*, 1274 tons, built by Robert Steele & Sons, Greenock, and launched in 1869.

The directors soon found that the day for sailing ships in the Montreal trade was nearly over. The tug-boat owners formed a combination, and exacted enormous sums for towage. To meet this the company built a tug-boat, the *Lake*. But although the ships made three rapid voyages in the summer season to Montreal, and one to the United States in winter, and obtained fair rates of freight, the directors finally decided to substitute steam for sailing ships. In the meantime the *Lake Michigan* left Portland, Maine, for Liverpool, and was never heard of again; and the *Lake Huron*, after being caught in the ice and wintering at Quebec, drifted ashore on Anticosti in a calm and was wrecked.

In contracting for steamships the directors made the same mistake that so many have made. The boats were too small, and could not compete successfully with larger boats. In fact, it was not then seen by anyone, as it is now, how much more economically large ships can be worked than small ones.

Their first boats were built in 1875—the *Lake Champlain*, *Lake Megantic* and *Lake Nepigon*, each about 2200 tons gross and 250 H.P. nominal (320 × 35 × 25). They were Clyde built, long, handy ships, schooner rigged, and good carriers, but somewhat slow for lack of power. Consequently, although they reduced the

saloon fare to \$50, they did not attract many passengers. They were followed, in 1879, by the *Lake Manitoba* and *Lake Winnepeg*, larger boats of about 3300 tons and 400 H.P. nominal, with spar decks ($355 \times 40 \times 31$), but still too small for freight purposes. The next was the *Lake Huron*, built on the Clyde in 1881, 4040 tons gross, 2646 net, with 500 H.P. nominal ($385 \times 42 \times 31$). She was more successful, but as freights were low, and other companies were continually building larger ships, the directors at length did what they should have done earlier. In 1885 they had built on the Clyde a magnificent ship of 4562 tons gross, and 2966 net ($400 \times 44 \cdot 2 \times 31 \cdot 7$), of full power, and with first-class accommodation for passengers—this was the *Lake Superior*. She carries a large cargo, and is a match for any of the Allan boats—except the *Parisian*—in speed, averaging fully 13 knots per hour. The saloon fare by this boat was raised to \$60, but she is very popular with first-class passengers, and deservedly so. Not having the very complete organisation of the Allans they did not carry as many steerage passengers, but in the spring of the year they had a fair share. All the boats are well ventilated, having cool chambers specially for the carriage of cheese, butter and eggs, and the *Lake Superior* is a favourite ship for the transport of horses, the trade in which is rapidly growing. They all carry live cattle and sheep too. The line, however, has had to contend with several disasters among the early ships, happily unattended by loss of life. The *Lake Megantic* was wrecked on Anticosti, the *Lake Manitoba* on St. Pierre, and the *Lake Champlain* on the north coast of Ireland, while the *Lake Huron* grounded on Berthier Shoal, below Quebec, and had to winter in the Levis graving dock for repairs. The *Lake Winnepeg*, however, received \$25,000 salvage for assisting the *Alaska* into New York with loss of rudder in 1885.

To keep up a weekly line the company bought in 1887 from James Laing, of Sunderland, the *Lake Ontario*. She is 4502 tons gross ($374 \times 43 \cdot 5 \times 29 \cdot 5$), with powerful engines of the latest type, about equal to the *Lake Superior* in speed, and handsomely fitted for all classes of passengers. Mr. Laing has long been celebrated as a shipbuilder, and the *Lake Ontario* has maintained his reputation. She has done her work well, making rapid passages and keeping clear of accidents. The boats have been running to Boston and New York in winter, but it is to be feared without any profit. The *Lake Winnepeg* was recently given new engines and boilers, so that four out of the five boats are strictly first-class. Of late years the company has met with no serious accidents, but the *Lake Nepigon* was damaged by ice in the straits of Belle Isle and

had to return to Montreal ; the *Lake Superior* struck an iceberg in the same strait in July, 1894, but reached Liverpool on the 9th with her fore compartment full of water ; and in March the *Lake Ontario* ran down a fishing schooner near Boston, but saved the crew. On the other hand, in 1892 the company met with an extraordinary piece of good fortune. The *Lake Huron*, on her way from Montreal to Liverpool, fell in with the North German Lloyd's steamship *Spree*, from Bremen for New York, on the 28th November, about 1000 miles west of Queenstown, with her main shaft broken and her after compartment full of water. The *Lake Huron* towed her to Queenstown in less than six days without mishap—a great feat. The *Spree* is a magnificent ship of nearly 7000 tons, and had 530 passengers on board. The *Lake Huron* is said to have received £24,000 (\$120,000) salvage.

Two of the remaining sailing ships have been sold. The company has paid no dividend since 1890, and such has been the extraordinary depression in freights that the ships have run heavily into debt ; they are now (February, 1895) all laid up and the company compelled to go into liquidation, with heavy loss to the shareholders and creditors.

CHAPTER XVIII.

GERMAN LINES.

THE HAMBURG-AMERICAN PACKET COMPANY.

THERE has long been a large German population in the United States, and consequently a large emigration from Germany in the spring and summer, while many Germans are constantly returning to visit the Fatherland.

For many years Germans, especially first-class passengers, preferred the Liverpool lines, but ultimately Germany followed the example of Great Britain in establishing lines of screw steamships between that country and New York.

The Hamburg-American Packet Company was the first of the German lines in the field. It had very small beginnings, but has rendered most valuable assistance to German trade. "At a time," say the directors of this great company, "when the British fleets almost ruled the maritime traffic, and England, with the aid of her great resources, was straining every endeavour to guard and to advance her supremacy in the mercantile and industrial field, a number of men of energy in Hamburg undertook, with what would at the present day be considered ridiculously small means, to try to enter the contest for the advantages of this traffic. When on the 27th May, 1847, the Packet Company, which was the popular name for the line, was formed with a capital of only 450,000 marks¹ (about \$112,500), nobody could have anticipated to what enormous proportions this modest enterprise was destined to develop, and which to-day is a conclusive evidence of German enterprise and commercial energy. . . . In the course of four decades the Packet Company has attained an eminence which

¹ The German mark is worth a fraction less than 24 cents in Canada (23·8), but for convenience' sake it will be considered in round numbers as equal to 25 cents (4 = \$1), it being understood that this is about 5 per cent. above its actual value.

makes it count as one of the most powerful competitors amongst the great steamship lines of the world. This famous undertaking has largely contributed to the opening up of new markets, thus proving one of the most powerful factors of Hamburg's success. At the present day the magnificent steamships of the company carry its flag over every sea, the passengers conveyed by it counting by millions, and the value of the merchandise carried by thousands of millions of marks. A sum of over one hundred millions of marks has been expended in building steamships, giving profitable employment to tens of thousands of industrious labourers."¹

For nine years after its formation the company carried on its operations by means of first-class sailing ships. The largest of these could only accommodate 200 passengers ; but as the traffic between the Old and the New World constantly increased, in 1853 the directors decided to place screw steamships on the line to New York.

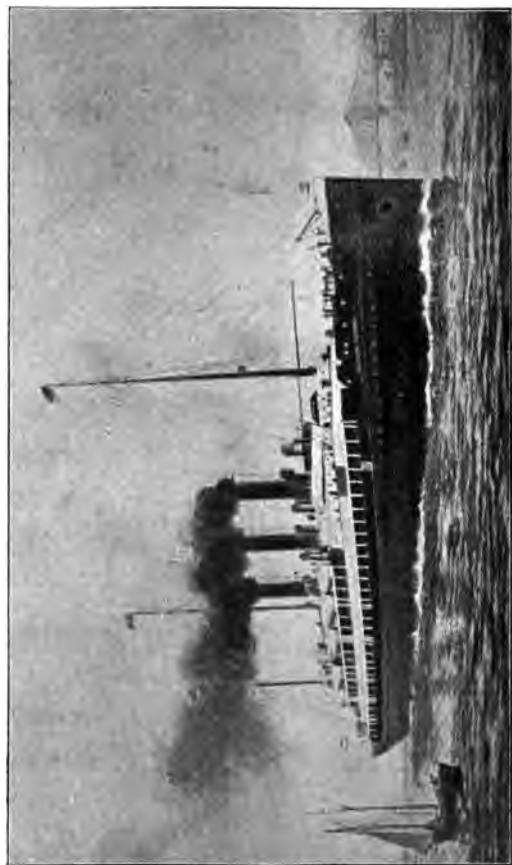
Until recently, the company very wisely went to the Clyde for all their boats. Their first steamship was the *Borussia*, an iron screw of 2349 tons, built and engined by Caird & Co., of Greenock, in 1855. This was the same year in which the Allan Line commenced their line, but five years later than David Tod's *City of Glasgow* had proved the possibility of running such boats.

The Hamburg boats had not at first quite the speed of the best British boats, but they carried large cargoes, and always had plenty of passengers. For some years, too, they called at Plymouth and Cherbourg, so as to secure a portion of the French traffic, but have since returned to Southampton as a port of call, from whence there is a daily line of steamboats running to Havre. The *Borussia* commenced her first regular sailings on the 1st June, 1856. She was followed by the *Hammonia*, a sister ship, and the results were so satisfactory that in the following year the company determined to apply for an increase of its capital by three million marks (\$750,000). The money was procured and two new steamships were built, increasing the fleet to four steamships and eight sailing vessels.

The directors' plans were then so modest that at a general meeting they said : "In view of these great proportions a further extension of the business cannot be contemplated."

Monthly sailings were maintained until 1860, in which year the company sold their sailing ships and in their place put four more

¹ Translation of memorandum issued by the agents.



"COLUMBIA."

steamships on the route, and were thus enabled to make the line to New York a fortnightly one. At the same time they despatched some of the boats to New Orleans.

On its 20th anniversary, in 1867, the company owned thirteen large Transatlantic steamships, besides several smaller boats, and, in addition, some very valuable real estate, and a dry dock, built with difficulty and at great expense. The capital stock then amounted to thirteen and a half million marks, and the debentures to nine millions. Up to this point the company appears to have done well, but now it experienced a turn in the tide. The severe crisis of 1866 on both sides of the Atlantic, the falling off in emigration, disasters at sea, reduced freight rates, and severe competition shook the company to its foundations. The period of depression, however, passed away, an era of prosperity set in, and the company gradually grew to the high position it now occupies, not unaccompanied, however, by some very serious drawbacks. Five years later, in 1872, its fleet consisted of twenty fine steamships, enabling it to maintain a regular weekly service to New York, with an extra sailing when necessary. It gradually extended its operations to the West Indies, Mexico, Baltimore, the West Coast of South America, China, Japan and Australia with considerable success. From a published return we learn that in 1874 the company's ships *Silesia*, *Frisia*, *Westphalia*, *Thuringia*, *Pommernia*, *Holsatia*, *Hammonia* and *Cimbria*, all running to New York, made an average time of 11 days 12 hours from Southampton, the *Silesia* making the shortest in 9 days 21 hours 56 minutes. Eastwards the average was only 10 days and 31 minutes, the *Frisia* making the shortest in 9 days 7 hours and 6 minutes.¹ Southampton is about 300 knots farther from New York than Queenstown. In April, 1875, the Eagle Line, running in opposition to New York, succumbed, and its five ships were absorbed by the Hamburg-American Company.

In 1888 the company decided to build four twin-screw boats, of great length and speed, to compete with the Liverpool lines. The *Columbia* they ordered from Laird Brothers, Birkenhead. She is $463 \times 55\frac{1}{2} \times 38$, 7578 tons gross, with triple expansion engines; cylinders 41, 66 and 101 inches, with $5\frac{1}{2}$ feet stroke, indicating about 12,500 H.P. The *Augusta Victoria* was built by the Vulcan Company of Stettin, in Prussia. She is $459 \times 55\frac{1}{2} \times 38$, with $5\frac{1}{2}$ feet stroke, 7661 tons gross, with triple expansion engines; cylinders 41, 67 and 106 inches, also indicating about 12,500 H.P.

¹ 'History of Merchant Shipping,' by W. S. Lindsay.

The *Normannia* was built on the Clyde by John Elder & Co. She is $500 \times 57\frac{1}{2} \times 38$, 8716 tons gross, with triple expansion engines; cylinders 40, 67 and 106 inches, with $5\frac{1}{2}$ feet stroke, indicating about 16,000 H.P. The *Fürst Bismarck* was built at Stettin. She is $502 \times 57\frac{1}{2} \times 38$, 8874 tons gross, triple expansion engines; cylinders 43, 67 and 106 inches, with $5\frac{1}{2}$ feet stroke, indicating about 16,000 H.P. The *Normannia* on her trial trip made 21 knots, the *Fürst Bismarck* 20·85. All four are superbly fitted with elegant saloons, ladies' cabins, smoking-rooms, and every modern luxury; they are also provided with bands of music, which play during the dinner-hour and on fine evenings. Thus it will be seen that the company was among the first to recognise the importance of twin screws, and contracted for the *Augusta Victoria* and *Columbia* when no other line had twin-screw passenger steamers running.

The *Augusta Victoria*, on her first voyage, made the fastest maiden trip then on record between Southampton and New York, 7 days 2 hours and 30 minutes.

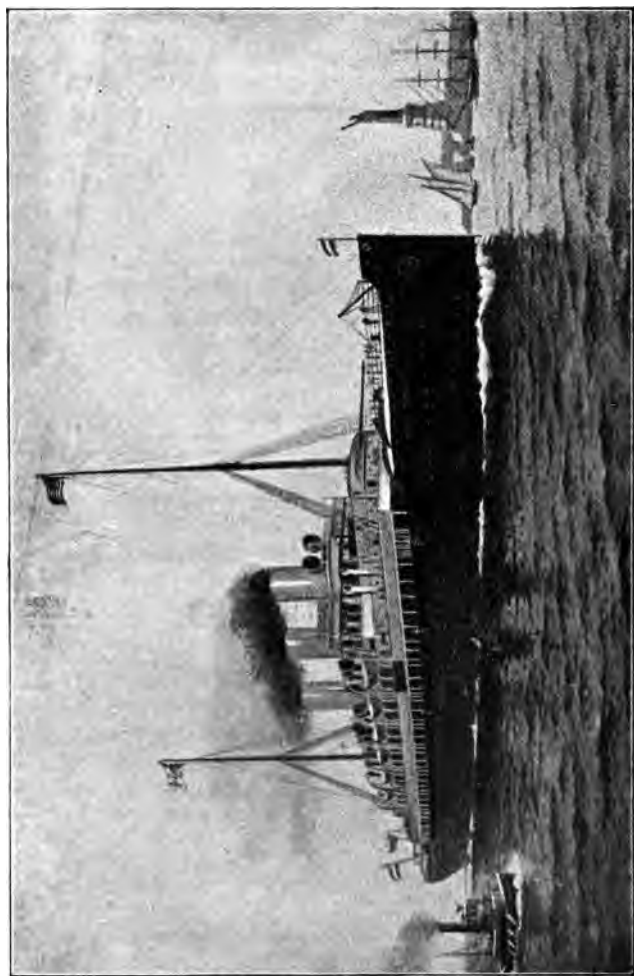
Imaginative New York reporters, however, telegraphed, and the press copied, the statement that "the difference between the Fastnet and Southampton was $24\frac{1}{2}$ hours, or 460 knots." The truth is that the distance from Queenstown is only about 270 knots, or 14 hours less than from the Needles, and from the Fastnet 330 knots, or about 17 hours. Nevertheless it was a splendid run.

As Southampton is near London the boats secure considerable English and American patronage, but they now have to meet the competition of the American Line. The *Augusta Victoria* has made the run in 6 days 19 hours 19 minutes; the *Columbia* in 6 days 15 hours; the *Normannia* in 6 days 10 hours 45 minutes, and the *Fürst Bismarck* in 6 days 10 hours 32 minutes, which is only a fraction of a knot less than the fastest passage made by the celebrated *New York*, 6 days 7 hours and 14 minutes.

A published return shows that in the ten years, 1881-91, the Hamburg-American Line carried more passengers to New York than any other line, except the North German Lloyd Company. The figures are :—

	Passengers.
1. North German Lloyd Company	738,668
2. Hamburg-American Packet Company	525,900
3. White Star Line	371,193
4. Cunard Line	323,900
5. Inman Line	322,930
6. Guion Line	237,836

A return which caused some surprise in Great Britain.



"FÜRST BISMARCK."

The company has recently absorbed the Hansa Line running between Hamburg, Antwerp and Montreal in summer, and to Boston in winter, and in 1893 increased the sailings to once a week, which, however, was not maintained in 1894, owing to the extreme depression in freights. They have since re-named these boats to make the terminations correspond with their other boats, viz., the *Wandrahm* has become the *Hispania*; the *Stubbenhuk* the *Sicilia*; the *Baumwall* the *Christiania*; the *Grasbrook* the *Dalecarlia*; the *Grimm* the *Scotia*; the *Kehrweider* the *Falconia*; the *Pickhuben* the *Georgia*; the *Steinhof* the *Canadia*; and the *Cremon* the *Dalmatia*.

The company now runs, in connection with the North German Lloyd, a line of boats between New York, Algiers, Naples, and Genoa, which is said to be a success; and (the H. A. L. alone) an occasional winter cruise to the Azores, Madeira, Gibraltar, Genoa, Malta, Alexandria, Jaffa, Smyrna, Constantinople, Athens, Messina, Palermo and Naples, and back to New York, lasting about ten weeks.

They have, too, recently added to their Atlantic fleet five large twin-screw steamships, especially adapted for live stock and fresh meat; if necessary, they can carry 2500 steerage passengers, or 7500 tons of cargo, and are so economical that they can make 13 knots an hour with a consumption of only 55 to 60 tons of coal per day. Two, the *Prussia* and *Persia*, were built by Harland & Wolff, of Belfast (445 × 50 × 34), about 6000 tons gross; two others were built by the Vulcan Company in Stettin, and one by Blohm & Voss, of Hamburg (460 × 52 × 35), are 7118 tons gross each; the *Palatia*, *Patria* and *Phoenicia*, making in all nine twin-screw boats, or more than any other line now running.¹ After the 1st July, 1895, the express steamers will touch at Cherbourg on their way to Southampton and Hamburg, where a special train will carry passengers to Paris. In June the *Augusta Victoria* will make a special trip to Norway, and in July the *Columbia* a second trip.

An invention by which the gases and smoke ordinarily carried off through the chimney are drawn back and re-consumed was recently tried on board the *Grimm*, and is said to have reduced her consumption of coal from 350 tons per trip to 250. The inventor is a Mr. Müller, of Hamburg.

The company, during the thirty-eight years of its existence, has not escaped disasters at sea, and, owing to the large number of

¹ More recently the company has contracted with Harland & Wolff, of Belfast, for a twin screw of 13,000 tons measurement.

steerage passengers carried, some of them have been accompanied by great loss of life. Thus, on the 13th September, 1858, the *Austria* caught fire, owing, it is said, to an officer putting a red-hot iron into a pitch-pot to fumigate the steerage, and of 538 persons on board only 67 were saved.

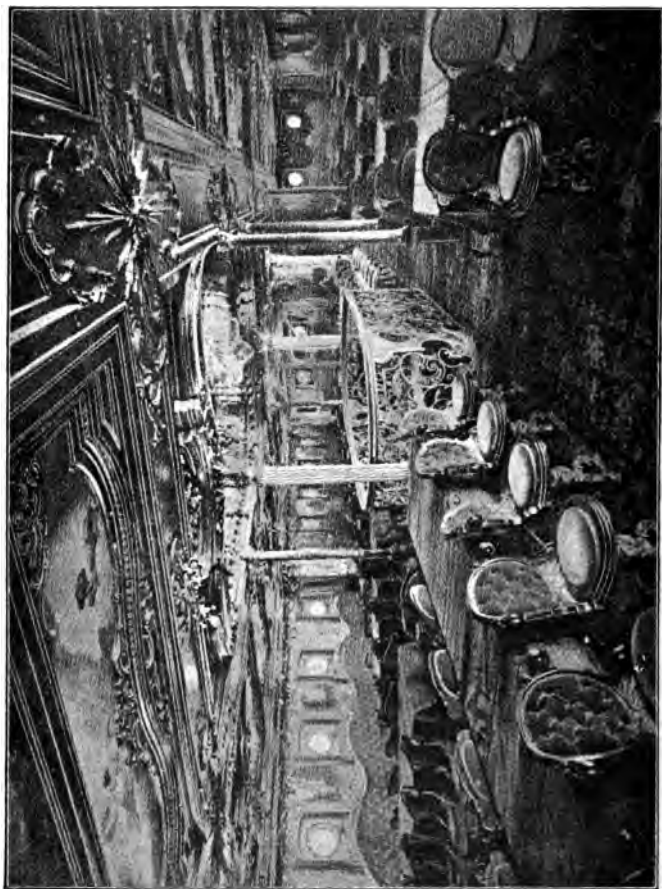
On the 7th May, 1875, the *Schiller*, of the Eagle Line, which had not then been formally taken over, was wrecked in a fog on the Scilly Islands, when 331 persons were drowned. The chief mate admitted at the official inquiry that they had "not once cast the lead." On the 26th November, 1878, the *Pommerania* was sunk off Folkestone by the iron barque *Moel Eilean*; 162 persons were saved by boats, but some 48 were missing.

In October, 1882, the *Herder* was wrecked off Newfoundland, but no lives were lost. On the 19th January, 1883, the *Cimbria* was sunk off the coast of Holland by collision with the British steamship *Sultan*, when 389 persons are said to have perished. But for the last eleven years the company's ships have met with no serious accident in the North Atlantic, and it must be remembered that, from first to last, this company alone has carried more than two million passengers.

The fleet now consists of fifty-eight fine ocean steamships, twelve river steamers, and thirty iron lighters, the total tonnage being a little over 200,000 tons. It owns besides a dry dock and a large establishment in Hamburg, a costly wharf property at Hoboken (New York), and an establishment at St. Thomas (W.I.).

From the balance-sheet annexed it will be seen that the financial affairs of the company appear to be managed in a very safe and conservative manner. Although the company made a net profit in 1893 of over four million marks, or nearly one million dollars, no dividend was declared, the whole profit, of about 10 per cent., being credited to the depreciation fund, thus reducing the book value of the fleet to a little more than one-third its cost when new—certainly a bold and wise policy. The French Compagnie Transatlantique value their ships at exactly double this sum per ton.

The capital of the company is thirty million marks (about seven million dollars), and it has issued 4 per cent. bonds for fifteen million marks. But it has a reserve of over three million marks (\$750,000) besides a fund for renewing boilers of 750,000 marks (\$187,000), while its insurance fund shows a very large surplus, $5\frac{3}{4}$ million marks, or nearly \$1,500,000, and it has eight million marks (\$2,000,000) in cash and saleable investments. The accounts are stated in an exceedingly simple manner and indicate great prudence on the part of the administration. The



"FÜRST BISMARCK'S" SALOON.

company does not appear to enjoy any postal subsidy from the German Government, but in 1893 it received the sum of \$45,311 from the United States Government for the carriage of mails from New York to Southampton and Hamburg at a very low rate. The company has branch offices at 37 Broadway, New York, 125 La Salle St., Chicago, and 14 Place d'Armes Square, Montreal.

A grand feature of both the great German lines is the benevolent fund for the sick, invalid and retired servants of the company, upon which some remarks will be found elsewhere. In 1893 the company contributed no less than 120,364 marks to this fund, or nearly \$30,000.

The company has over 6000 permanent employes, besides many hundreds of others who work during the greater part of the year.

THE HAMBURG-AMERICAN LINE

(Established 1847)

Is the oldest German Transatlantic line. Its express steamers are the largest and fastest of the German merchant marine.

This is the only line maintaining a twin-screw express steamer service between the continent of Europe and America.

FLEET OF THE HAMBURG-AMERICAN LINE.

TWIN-SCREW EXPRESS STEAMERS.

Steamer.	Tonnage.	H.P.	Steamer.	Tonnage.	H.P.
1. Fürst Bismarck .	8,874	16,400	3. Augusta Victoria	7,661	13,000
2. Normannia . .	8,716	16,000	4. Columbia . . .	7,578	13,000

REGULAR MAIL STEAMERS.

5. Palatia	Twin-Screw S.S.	7,118	5,500	26. Polonia . . .	2,893	1,500
6. Patria . . .		7,118	5,500	27. Venetia . . .	2,891	1,500
7. Phoenician .		7,118	5,500	28. Christiania . .	2,889	1,400
8. Prussia . . .		6,000	5,000	29. Virginia . . .	2,884	1,600
9. Persia . . .		6,000	5,000	30. Helvetia . . .	2,849	1,400
10. Dania . . .		4,379	3,100	31. Hispania . . .	2,730	1,200
11. Scandia . .		4,372	3,100	32. Polaria . . .	2,724	1,200
12. Russia . . .		4,017	3,300	33. Scotia . . .	2,692	1,400
13. Moravia . .		3,739	2,000	34. California . .	2,690	1,350
14. Suevia . . .		3,609	2,250	35. Hercynia . . .	2,617	1,500
15. Rhaetia . .		3,553	2,200	36. Bolivia . . .	2,614	1,780
16. Gellert . . .		3,533	3,000	37. Canadia . . .	2,479	1,200
17. Wieland . .		3,504	3,000	38. Gothia . . .	2,423	1,180
18. Italia . . .		3,498	1,900	39. Francia . . .	2,388	1,000
19. Rugia . . .		3,467	2,600	40. Valesia . . .	2,332	1,150
20. Markomannia		3,451	2,000	41. Slavonia . . .	2,274	1,150
21. Bohemia . .		3,410	1,600	42. Polynesia . .	2,196	1,000
22. Cheruskia . .		3,365	1,500	43. Australia . .	2,185	640
23. Georgia . . .		3,264	1,827	44. Dalmatia . . .	2,132	805
24. Sicilia . . .		3,062	1,600	45. Flandria . . .	2,098	1,200
25. Galicia . . .		2,921	1,200	46. Ascania . . .	2,082	1,100

REGULAR MAIL STEAMERS—*continued.*

Steamer.	Tonnage.	H.P.	Steamer.	Tonnage.	H.P.
47. Croatia . . .	2,052	1,100	59. Hansa . . .	528	200
48. Hungaria . . .	2,036	1,000	60. Export . . .	450	250
49. Dalecarlia . . .	2,005	900	61. Expedient . . .	450	250
50. Thuringia . . .	1,964	800	62. Express . . .	450	250
51. Holsatia . . .	1,867	800	63. Concurrent . . .	250	100
52. Rhenania . . .	1,843	850	64. Pilot . . .	250	100
53. Allemannia . . .	1,841	850	65. H.-A. P. A.-G. .	100	50
54. Borussia . . .	1,777	800	66. Assistent . . .	100	50
55. Teutonia . . .	1,762	800	67-72. 6 steamships	...	...
56. Bavaria . . .	1,748	800	73-98. 27 lighters	...	...
57. Saxonia . . .	1,746	800	99. 1 floating steam crane...	...	...
58. Blankenese . . .	700	350	Total tonnage . . .	200,308	

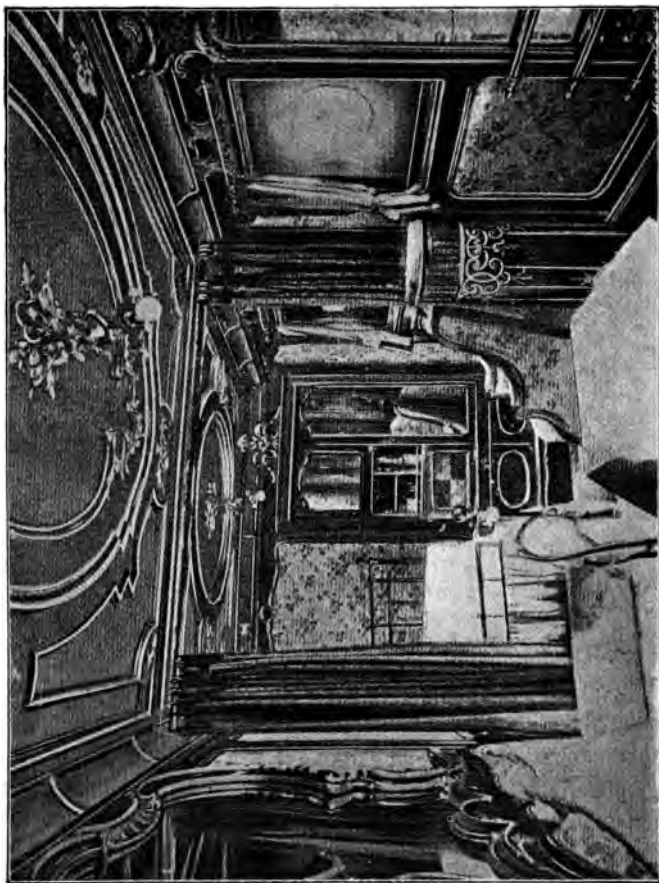
Extracts from "Report of the Directors of the Hamburg-American Packet Company for 1893."

	Marks.
The account shows a profit of	4,535,753*91
Deduct the interest on preferred loan	475,000
We have	4,060,753*91

Which sum has been written down for depreciation in the value of our fleet, etc. We regret that we feel obliged to suggest that no dividend be declared for the past business year on account of the present depreciation in the value of our vessels. On account of the numerous inventions and improvements which have been made in recent years in machinery and vessel construction, old steamers can be utilised with profit only if their book-value can be lowered an unusual degree. Again, in consequence of the depressed condition of the shipping business, new vessels can be contracted for at lower figures than ever before. The administration of a steamship company, which fully recognises its responsibilities, dare not neglect at this time to strive to bring the book-value of its flotilla, as far as possible, up to the standard required by circumstances.

The cholera epidemic has influenced our earnings in the past year almost as much as did the great catastrophe of the foregoing year.

Hand in hand with the lossess through the abnormal conditions on this side was the unfortunate circumstance of the long crisis in the United States, which had its effect on the North Atlantic passenger and freight traffic; . . . also the attraction of the Exposition in Chicago worked together greatly to reduce the yearly American cabin passenger traffic towards Europe every spring, and back again in the autumn. The traffic which went from Europe to the Exposition in Chicago was very meagre, and most of this was second instead of first-class, and therefore did not in any way compensate us for the loss of our normal business. . . . The contract of the North Atlantic steamship companies has given satisfaction to the united parties during the past year, and has been the cause of still closer relations between us and the North German Lloyd's. We have closed a contract for several years with the administration of the North German Lloyd's, by which we in common shall carry on, not only the lines between New York and the Mediterranean, but



"FÜRST BISMARCK'S" CHAMBRE DE LUXE.

also the cabin traffic to and from Hamburg, Bremen, Southampton, as also the out-going freight traffic, and have regulated the division of receipts, and thus set aside competition between our companies. That through this union the earning capacity of the two companies is greatly increased, is certain, and there is no doubt that this union of the German companies gives a power which will be sufficient to keep competition within bounds and afford protection against all competitors.

At the extraordinary general assembly of April 24, last year, it was decided to call in our first preferred loan, amounting to 8,750,000 marks, and in place of it give a new one, in amount 15,000,000 marks. This decision was carried into effect in May.

We had no great accidents in the past year ; but a succession of average damages has unfavourably influenced our reserve insurance account. The additions thereto were 272,285.17 marks, and the account now amounts to 5,749,179.22 marks.

The contributions of our company to the sick, invalid and retired insurance funds was 120,364.78 marks in 1893.

During the year 1893, 315 round trips were made, on which 103,114 passengers of all classes, and 1,226,354 cubic metres freight were transported.

<i>Dr.</i>	PROFIT AND	Marks.
Income tax		65,633'00
Commercial expense account		190,844'53
Interest on preferred obligations		475,000'00
Business profit for 1893	4,535,753'91	
Deduct interest on loan	475,000'00	
		4,060,753'91
Depreciation of steam vessels	3,530,942'94	
" " buildings	68,982'98	
" " storehouse, Montreal	5,000'00	
" " sinking fund account	13,767'19	
Carried forward for renewing boilers and other repairs	442,060'80	
	4,060,753'91	
		4,792,231'44

Dr. BALANCE SHEET, DECEMBER 31, 1893.

	Marks.
Bank, cash, bills of exchange, mortgages, imperial and other securities, and loans at banks	8,030,271'95
Fifty-one sea-going steamships	38,725,021'50
Advances on two new twin screws	3,653,620'27
Eight river steamers, six steam sloops, hoisting machine and barges	428,003'00
Twenty-one iron lighters	167,000'00
Two iron lighters at St. Thomas	4,000'00
Dry dock on the Little Grasbrook	650,000'00
Dwelling, storehouse and workshops	265,000'00
Administration building	615,000
Deduct mortgage	300,000
	315,000'00
Warehouses, &c., in Havre, Stettin, Montreal, St. Thomas, and barracks	165,069'25
Landing place in Hoboken	2,440,000'00
Coal on hand	144,076'08
Equipment magazine dock	408,056'14
Insurance account, premiums brought into account, 1894	290,221'28
On account of pending voyages, debit account	1,127,428'66
Sundry debits	1,826,920'90
	58,639,689'03

LOSS ACCOUNT, 1893.

Cr.

	Marks.
Profit of Transatlantic voyages	3,632,036.53
„ river steamers and lighters	61,106.53
„ on dry dock	68,186.91
„ on equipment, magazine and workshop	71,766.70
Landing-place in Hoboken	241,207.47
Accrued interest	173,356.95
Reserve insurance, account carried forward	544,570.35

4,792,231.44

BALANCE SHEET, DECEMBER 31, 1893.

Cr.

	Marks.
Capital stock, 30,000 shares of 1,000	30,000,000.00
4 per cent. preferred loans of 1893	15,000,000.00
Reserve account	3,291,734.93
Account for renewing boilers and repairs,	
January, 1893	750,000.00
Deduct repairs in 1893	442,060.80
	307,939.20
Add profit carried forward	442,060.80
	750,000.00
Reserve insurance account, January, 1893	5,476,894.05
Add savings of premiums for 1893, less	
sea damage	816,855.52
	6,293,749.57
Deduct year's profit	544,570.35
	5,749,179.22
Sinking fund account, not taken up	39,500.00
Coupon account, interest not taken up	12,125.00
Dividends unpaid	1,778.44
Prepaid tickets to be used at any time	532,328.70
Assistance account (less invested)	151.42
Acceptance account, drafts to be collected from agencies	560,165.66
Insurance premium, account to be paid, 1894	196,500.00
Sundry credits	2,506,225.66
	58,639,689.03

CHAPTER XIX.

THE NORTH GERMAN LLOYD COMPANY.

THE "North German Lloyd Company," of Bremen, was the second German line of Transatlantic steamships. It was founded in 1857, when the fleet consisted of three steamers running to England. As is so often the case, the success of this great company is said to be mainly due to one man, the late Mr. H. H. Meier, who for many years was its life and soul. He succeeded in amalgamating the various steamship companies then existing and forming out of them this company, which has gradually become one of the greatest steamship companies in the world. In June, 1858, the New York line was opened *via* Southampton, with the screw steamship *Bremen* (318 × 40 × 26), 2674 tons, followed by the *New York*, *Hudson* and *Weser*, all built by Caird & Co., of Greenock. These boats were so satisfactory that for a great many years they confined themselves to this yard. In all, Caird & Co. are said to have built some forty ships for the company. In 1862 and 1863 the *Hansa* and *America*, followed by the *Hermann*, *Deutschland*, and *Union*, were added to the line, all built by Caird & Co. In 1866 it became necessary to establish a weekly line to New York, and the following year the fleet numbered fourteen steamers, of which eight were in the New York trade and six in the English. In 1869 the company extended their operations to New Orleans, and in 1870 to the West Indies; in 1875, to Brazil and the River Plate. Most of their boats have been called after the principal rivers of Germany. A printed return shows that in 1874 the average weekly passages westward from Southampton of the company's boats, *Donau*, *Moselle*, *Hermann*, *Hansa*, *Weser*, *Rhein*, *Main*, *America*, *Oder*, *Neckar*, *Deutschland*, *Hohenstauffen* and *Hohenzollern*, was 11 days 13 hours, the *Main* making the quickest in 9 days 14 hours 20 minutes. Eastward, the average for the same year was only 10 days 8 hours 58 minutes, the *Moselle* making the



"HAVEL."

quickest in 9 days 8 hours 50 minutes.¹ In 1880, under the spirited management of Herr Lohmann, the present managing director, the company decided that the future of the passenger traffic and of the mail service lay with express steamers, offering to passengers greater speed and safety, "combined with special elegance and comfort during the voyage." These considerations led to the building of a whole fleet of express steamers, most of which came from the yard of John Elder & Co., Fairfield, Glasgow. On the 26th June, 1881, the first of the new boats left Bremen for New York. They number twelve in all, as follows :—

Year.	Name of Ship.	Tons.	I.H.P.
1881	Elbe	4,510	5,600
1882	Werra	4,815	6,300
1883	Fulda	4,814	6,300
1884	Ems	4,728	7,000
"	Eider	4,719	7,000
1886	Aller	4,964	8,000
"	Trave	4,966	8,000
"	Saale	4,965	8,000
1887	Lahn	5,097	9,000
1889	Kaiser Wilhelm II.	6,990	6,500
1890	Spree	6,963	12,500
"	Havel	6,963	12,500

The three last named were built at Stettin by the Vulcan Co. The speed of these boats ranges from 16 to 19 knots, and they make the passage between Southampton and New York in about seven days with great regularity. All are single screws. The *Spree* has made the eastward passage in 6 days 22 hours, and the *Lahn* in 6 days 22 hours 42 minutes. The ships' saloons, ladies' rooms, and smoking-rooms, are not only provided with every comfort, but are decorated by renowned artists with masterpieces of art, both in painting and wood-carving, in quite a different style to the early boats.

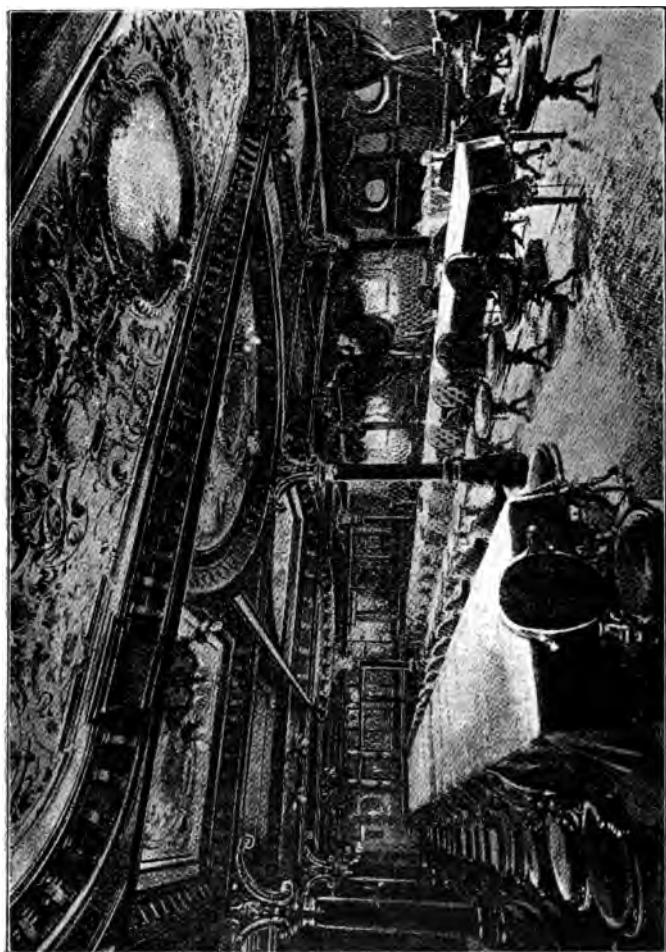
In 1885 the company secured a Government contract for the establishment of five new lines to India, China, Japan, and Australia, with branch lines in the Mediterranean and the Pacific Ocean, requiring six new steamers to be built. As the contract required all the boats to be built in Germany, they were built by the Vulcan Co., of Stettin, in Prussia. The subsidy was a very large one, and much higher per mile than that paid by the British Government to the great Peninsular and Oriental Company. But

¹ 'History of Merchant Shipping,' by W. S. Lindsay.

the result appears to have been very disappointing to the company, proving that post-office subsidies are by no means as profitable as are generally supposed. The original subsidy was 4,490,000 marks, or in round numbers \$1,100,000, or say, £210,000 sterling per annum, for fifteen years, the total mileage being 782,567 miles, or about \$1.40 per mile, less than one-half, however, that paid by the United States Government. The accounts of the ships sailing under the contract appear to have always been kept separately, and the result was that, in addition to loss of interest on the cost of the ships, in five years the company lost several million marks. Between 1880 and 1890 the average dividend was $7\frac{1}{2}$ per cent. per annum, and in one good year 12 per cent. was paid. But in 1891 the company could not pay any dividend, and in 1892 the Government Mail Line was carried on at a loss of 35,040 marks. In that year the company obtained a remodelling of the contract, and abandoned a portion of the subsidy. In 1893 matters improved, the Mail Line leaving a profit of about 1,000,000 marks, and the company paid a dividend of 3 per cent.

During the autumn of 1891 the New York-Genoa Line was commenced, which proved a success from the start, and since the winter of 1892-3 a regular service has been maintained between New York and Genoa, Naples and Alexandria; also a new line between New York and Naples. An arrangement was also made with the Hamburg-American Company to work the Mediterranean lines jointly and share the profits fairly between the two companies. In 1893-4 a fortnightly line, known as the Roland Line, was established by the company between Bremen and New York, for steerage passengers and cargo only. For this line they purchased the *Roland*, 3600 tons, 2500 I.H.P., built at Newcastle-on-Tyne, and built two twin-screw steamers, the *Wittekind* and *Willehad*, each 4500 tons gross, and 2700 I.H.P., and capable of carrying 2400 passengers. The latter were built by the firm of Blohm & Voss, in Hamburg.

In December, 1893, the company owned eighty steamships, including six under construction, of 225,097 tons gross, and 202,731 I.H.P., and seventy-eight tenders, barges, etc., of 15,955 tons. It also owns two large dry docks, numerous workshops, buildings for nearly every branch of the trade, a special railway and telegraph station, and coal sheds, all at Bremerhaven, occupying an area of 2600 square metres, and employing 1200 mechanics and labourers. The store-rooms, laundry and main offices of the company are at Bremen, as also a special railway



"HAVEL" SALOON.

station and baggage hall. The total number of persons employed by the company is about 10,000. To protect their employ es and provide for their families in cases of old age, sickness, or death, the company formed, in 1873, the "Seemannskasse," which has been carried on very successfully on the co-operative plan.

	Marks.	About
The receipts from 1873 to 1892 were	2,592,855'20 =	\$648,000
The expenditure	794,481'95 =	\$198,000
The reserve fund, January, 1893	1,798,373'25 =	\$450,000
To this fund the company appears to have given in 1893	40,472'20 =	\$10,000

In 1893 the company also formed "A Widow and Orphan Pension Treasury," and contributed 20,000 marks (\$5000) to it from the profits of the year.

NORTH GERMAN LLOYD FLEET, 1893.

	Tons.	I. H. P.		Tons.	I. H. P.
<i>Express steamers.</i>			<i>Passenger and cargo steamers—continued.</i>		
1. Kaiser Wilhelm II.	6,990	6,500	38. Braunschweig . . .	3,173	2,200
2. Havel	6,963	12,500	39. Strassburg	3,025	1,600
3. Spree	6,963	12,500	40. Weser	2,823	1,300
4. Lahn	5,097	9,000	41. America	2,752	2,000
5. Trave	4,966	8,000	42. Hannover	2,571	1,275
6. Saale	4,965	8,000	43. Köln	2,556	1,150
7. Aller	4,964	8,000	44. Graf Bismarck . . .	2,406	900
8. Werra	4,815	6,300	45. Kron Prinz Fredk.		
9. Fulda	4,814	6,300	William	2,395	1,350
10. Ems	4,728	7,000	46. Leipzig	2,388	1,250
11. Elbe	4,510	5,600	47. Berlin	2,334	1,225
<i>Government mail steamers.</i>			48. Baltimore	2,321	1,225
12. Prinz Regent Luitpold	6,500	5,000	49. Stettin	1,815	1,600
13. Prinz Heinrich . . .	6,500	5,000	50. Danzig	1,814	1,600
14. Karlsruhe	5,347	3,200	51. Adler	1,336	1,200
15. Bayern	5,343	4,000	52. Schwan	1,232	500
16. Sachsen	5,338	4,000	53. Condor	1,230	500
17. Oldenburg	5,318	3,200	54. Falke	1,100	650
18. Preussen	4,658	4,000	55. Albatross	1,083	650
19. Hohenzollern	3,288	2,300	56. Möwe	940	450
20. Hohenstaufen	3,283	2,300	57. Schwalbe	935	450
21. Neckar	3,250	3,250	58. Reiher	896	700
22. Habsburg	3,217	2,300	59. Sperber	895	700
23. Salier	3,214	2,300	60. Sumatra	584	350
24. Nürenberg	3,207	2,200	61. Kehrweieder	499	570
25. Lubeck	1,815	1,600	62. Najade	450	1,800
<i>Passenger and cargo steamers.</i>			63. Willkommen	409	500
26. H. H. Meier	5,478	4,200	64. Retter	361	650
27. Stuttgart	5,349	3,200	65. Forelle	298	650
28. Gera	5,319	3,200	66. Lloyd	297	300
29. Weimar	5,318	3,200	67. Laebs	270	550
30. Darmstadt	5,316	3,200	68. Herkules	244	370
31. Wittekind	4,990	2,500	69. Hecht	243	650
32. Willehad	4,990	2,500	70. Saturn	200	350
33. Dresden	4,802	2,600	71. Vulcan	200	300
34. Munchen	4,801	2,600	72. Roland II.	187	450
35. Pfalz	3,870	2,500	73. Fulda II.	153	240
36. Mark	3,835	2,500	74. Quelle	151	75
37. Roland	3,720	2,500	75. Vorwärts	148	275
			76. Triton	133	200
			77. Centaur	177	346
			78. Cyclop	129	200
			79. Comet	107	180
			80. Libelle	74	250

80 steamships. Total, 225,097 tons, 202,731 I. H. P.

Tenders, barges, etc., 15,955 tons.

•

*Extracts from Report of North German Lloyd Company
for the year 1893, dated 18th April 1894.*

	Marks.
In 1893 the surplus amounted to	9,825,443·85
Deduct 10 per cent. of insurance profit	3,293·40
„ 20 per cent. of premium surplus	445,530·55
	<u>448,823·95</u>
	9,376,619·90
Interest on loans	848,000
Ordinary business expenses, less charged to	
Government line (156,857·80)	532,913
Income tax	93,462
Connecting lines	89,734·45
Invalid and aged insurance fund	40,472·20
	<u>1,604,581·65</u>
	7,772,038·25
Carried over from 1892	3,181·00
	<u>7,775,219·25</u>
Leaving a surplus of	7,775,219·25
Deduct for depreciation :	
On Government mail steamers.	1,042,700
„ other steamers	5,317,000
	<u>6,359,700</u>
Diverse real estate, &c.	195,377·10
	<u>6,555,077·10</u>
Profit	1,220,142·15
Disposed of as follows :	
3 per cent. dividend on 40,000 shares	1,200,000
Contribution to widows' and orphan fund.	20,000
Carried over to 1894	142·15
	<u>1,220,142·15</u>

The business year began under unfavourable conditions. On account of the prevailing cholera epidemic in Hamburg, America placed restrictions on immigration into that country, and up to March 1st of the past year we were obliged to discontinue carrying steerage passengers to the United States. . . . These conditions improved with the beginning of spring by active emigration to the United States, which continued far into the summer months, but on account of the financial depression in the United States was entirely stopped in the autumn. The transportation of cabin passengers to the United States fell far short of expectations which were cherished by all on account of the World's Columbian Exposition in Chicago, and at the same time the cabin passengers from the United States to Europe showed a decided decrease, caused undoubtedly by the anxiety about the return of the cholera in Europe, the

interest manifested in America in the Columbian Exposition, and also the financial conditions existing in the United States.

The lines Bremen-New York and Bremen-Baltimore have made good returns for the months of March to August. The Roland Line, opened in April, which we were obliged to carry on during the past year almost entirely by chartered vessels, has developed a marked increase in valuable traffic *viâ* Bremen. We have placed on this line in the course of the year our newly acquired steamer *Roland*. In April and May the two twin-screw steamers *Wittekind* and *Willehad* will be placed in service, and it will then be possible to establish regular trips every fourteen days, *viâ* the Roland Line, between Bremen and New York.

The express steamship line between Genoa and New York has been well developed. After the Hamburg-American Company decided on its own behalf to establish a fast service between New York, Naples and Genoa during the winter months, at the close of the year we opened negotiations with this company for arrangements to carry this traffic jointly during the winter months on this line, with weekly expeditions. These negotiations led in the course of the year to a satisfactory agreement as regards the proportionate division of the profits resulting from this common line. The good results of the lines between Naples and New York, begun in April of last year, have induced us to establish an independent line between these two places, which we have also, since the beginning of this year, carried on jointly with the Hamburg-American Company. . . . During the last few weeks we have extended the trips of the steamers on this line to Messina and Palermo.

A comparison of the passenger traffic on the transoceanic trips shows the following figures:—

Total 1892	.	.	.	.	.	202,111
„ 1893	.	.	.	.	.	203,258

Made up as follows :

	1893.		1892.	
	Out.	In.	Out.	In.
New York Line . . .	108,543	48,531	95,216	39,147
Baltimore Line . . .	20,586	4,409	44,746	3,850
South American Line . .	4,866	2,542	3,117	4,349
Eastern Lines . . .	8,370	5,411	7,236	4,420
Total	203,258		202,111	

Up to December 31st, 1893, the Nord-deutscher Lloyd carried, on transoceanic trips, 2,957,996 passengers.

The insurance account closes the past year with a surplus of 32,933'75 marks. The contract entered into with other continental steamship companies for passenger traffic to North America has been extended over the current year.

In order to lessen the competition for freight, we entered into an agreement with the same companies in regard to freights, and finally, we have agreed with the Hamburg-American Line by which both companies are to receive their share of the American cabin passenger business. The seamen's treasury had control on December 31st, 1893, of a capital of 1,870,895 marks.

The rich blessings resulting from this treasury have caused us to establish on the same principles a widow and orphan pension treasury, for the surviving relatives of our employés and seamen. We believe we act in accord with the stockholders when we appropriate 20,000 marks for it out of the profits of the past year. . . . We are now engaged on the plans for building another fast steamer for the New York Line.

In 1893 the company carried 203,258 transoceanic passengers; from 1881 to 1891, ten years, it carried 738,668 passengers to New York, against 525,900 carried by the Hamburg-American Company, and from its foundation to the end of 1893 it has carried nearly three million passengers—2,957,996.

The balance sheet for 1893, annexed, shows that the capital of the company is forty million marks, nearly ten million dollars, and it has made 4 per cent. loans for a little over 50 per cent. of its capital, 20,618,500 marks. It also reveals much the same spirit of conservative financing shown in the accounts of the Hamburg-American Line. Thus it has written off from first to last over 43 per cent. of the cost of its ships for depreciation, leaving their value at about \$77 per ton gross, not so great an allowance as its sister company, but then no less than ten of its express steamers are nearly new, very costly, and fitted with modern machinery. It has also written off large sums for depreciation of its wet and dry docks, real estate, wharves and piers. It has not as large a cash surplus as the Hamburg Company, but it appears to have paid in cash six million marks on account of new ships without increasing its capital or loans. It had a "reserve" fund of 4½ million marks (\$1,100,000), a "renewal" fund of over 7 million marks (\$1,800,000), and an "insurance" fund of over 5½ million marks (\$1,400,000), all which proves that it is in a very strong position financially. Yet the directors only declared a 3 per cent. dividend for 1893.

For many years this company was comparatively free from serious accidents in its Atlantic lines, but latterly it has met with its full share. On the 6th December, 1875, the *Deutschland*, bound to New York, was wrecked on the Kentish Knock sand near the mouth of the Thames, when about 70 persons were lost, and the captain was censured. Then for nineteen years no accident involving loss of life occurred, but on the 31st January, 1892, the *Eider*, bound from New York to Bremen, struck on the Isle of

Dr. BALANCE SHEET, 31ST DECEMBER, 1893,

	MARKS.	MARKS.
74 steamships, 78 lighters, 2 barges and equipment, cost	117,756,616'95	
Depreciation from beginning.	51,332,816'95	
Payments on account 6 new ships . . . . .	..	66,423,800
Repair shops in Bremen, dock, etc.	657,072'50	6,052,903'05
Depreciation.	272,072'50	
New laundry, machinery, etc.	319,380'25	385,000
Depreciation.	89,380'25	
Old laundry, capital account . . . . .	..	230,000
Real estate, buildings, etc., cost	846,002'80	000,001
Depreciation.	286,002'80	
Floating dock, Bremerhaven, cost	45,764'15	560,000
Depreciation.	25,764'15	
Dry Dock, Bremerhaven, etc, etc.	3,184,423'65	20,000
Depreciation.	764,423'65	
Agents' building and house, etc.	560,217'75	2,420,000
Depreciation.	70,217'75	
Pier at Hoboken, storehouse, etc.	2,188,945'85	490,000
Depreciation.	405,471'85	
Baggage depôt in Bremen, cost	99,498'85	1,783,474
Depreciation.	39,498'85	
Provision warehouse, Bremerhaven	53,590'75	60,000
Depreciation.	43,590'75	
Coalyard in Bremerhaven	25,591'90	10,000
Depreciation.	5,591'90	
Freight warehouse, 1 and 2, Kaiserhaven	73,300	20,000
Depreciation.	73,298	
Station building, Bremerhaven, cost	135,780'60	000,002
Freight warehouses, Bremerhaven, cost	104,048'45	000,001
Steam-dredger and equipment, cost	21,588'50	000,002
Storehouse, Bremerhaven, cost.	44,166'15	000,002
Supplies and coal . . . . .	..	000,001
Iron ballast account, cost	112,197'70	1,758,268'70
Repair workshop, materials and machines . . . . .	..	5,000
Laundry business account . . . . .	..	2,219,524'30
Investments in bonds and stocks . . . . .	..	1,643'65
Cash in Imperial Bank . . . . .	..	108,901'40
Equipment for current trips, cash at Agencies, and credit at banks . . . . .	..	8,390'95
		4,064,616'85
MARKS		86,621,531'90

NORTH GERMAN LLOYD STEAMSHIP CO.

Cr.

	MARKS.	MARKS.
Capital stock . . . . .	..	40,000,000
Loans, 4 per cent., 1883	11,808,000	
Loans, 4 per cent., 1885	8,810,500	
		20,618,500
Dividends unpaid . . . . .	..	5,760
Insurance reserve fund, 1892	178,647'90	
10 per cent. of 1893 profit.	3,293'40	
		181,941'30
Reserve fund from 1892 . . . . .	..	4,533,377'15
Renewal fund from 1892	7,612,790'95	
Less new boilers	400,000	
		7,212,790'95
Insurance fund from 1892	5,213,401'25	
Premium surplus, 1893	445,530'55	
		5,658,931'80
Loan interest account . . . . .	..	6,888
Seamen's treasury, loan or bonds	232,500	
Creditor in current account	46,034'05	
		278,534'05
Sundry creditors:—		
Unpaid accidents, etc.	940,218'20	
Prepaid passages.	846,748'30	
Current accounts	2,924,583'60	
Current drafts of agents and contractors	1,567,130'75	
Subsidy from the Empire, 1894, to be taken into account	625,985'65	
		6,904,666'50
Profit and loss account: profit . . . . .	..	1,220,142'15

Marks . . . 86,621,531'90

Wight in a dense fog. All the passengers and crew, 393 persons, the specie, mails, and part of cargo were saved by the gallant efforts of the noble British lifeboat service, in recognition of which the Emperor of Germany sent £200 sterling to the Lifeboat Institution, and gold watches to some of the men. The ship was ultimately got off the rocks on the 7th March and towed to Southampton. On the 26th November of the same year, the *Spree*, bound to New York, broke her main shaft and filled her after compartment about 1000 miles West of Ireland, but was safely towed back to Queenstown by the *Lake Huron*, for which service, it is said, the company paid £24,000 salvage. On the 5th June, 1893, the *Kaiser Wilhelm II.* sank at her wharf at Genoa, through an open valve, but was speedily pumped out and raised without damage to the ship. In March, 1894, the *Ems*, bound to New York, broke her propeller frame and was towed into Fayal by the *Wildflower* (s.s.). Her passengers were all safely transferred to the *Kaiser Wilhelm II.*, and the *Ems* was afterwards towed back to Southampton by tugs. On the 17th June, 1894, the *Stuttgart* had a most extraordinary escape on the English coast. She went ashore, half a mile east of the Start Point, in a fog, with 534 passengers on board. Soon after her sister ship, the *Gera*, appeared on the scene, and towed her off in ten minutes, and though there were rocks on either side of the *Stuttgart*, she was undamaged and proceeded! But now came the greatest disaster the company has ever experienced, the details of which are too fresh in the public mind to need recapitulation here. On the morning of 30th January, 1895, in the North Sea, the express steamer *Elbe*, bound from Bremen to New York, with 324 souls on board, through no fault of her own, was struck near the engine-room by the Scotch steamer *Crathie*, and in twenty minutes was engulfed, only 21 persons escaping on board the fishing smack *Wildflower*, which landed them at Lowestoft.

As a set-off to these disasters, a noble act must be recorded. On the 14th March, 1886, the Cunard s.s. *Oregon* of 8000 tons was struck in a very similar manner by a schooner near Fire Island, N.Y. Happily the North German Lloyd steamer *Fulda* hove in sight before she sank, saved the whole of the passengers and crew, 824 souls, and landed them in New York the next day. The agent cabled to the directors, "What compensation shall we demand?" and to their infinite credit the directors replied, "Highly gratified having been instrumental in saving so many lives. *No claim!*"

Considering that during these thirty-seven years the company's

ships have safely carried over 2,900,000 passengers, the record is not a bad one.

It is now stated that the company intends shortly to run a service of three fast steamers, fortnightly, between Manchester and Brazil, Australia, China and the West Indies, and another line between Manchester and Quebec and Montreal.

It is also reported that the company will endeavour to utilise a recent fuel-saving invention on their steamers. It consists of coal dust blown into a chamber beneath the boilers by jets of compressed air or steam. Every particle of the dust is consumed, producing an intense heat. If, as it is said, ample coal dust can be procured in Germany at 25 cents per ton, the saving will be immense.

CHAPTER XX.

LA COMPAGNIE GÉNÉRALE TRANSATLANTIQUE.

THIS company was formed in 1862, and from the first has been heavily subsidised by the French Government, as it still is. The system is peculiar to France, but the results are not encouraging. In 1881, a law granting bounties for the construction and navigation of vessels under the French flag was enacted, and in 1893 this law was modified and expanded. The operations of the Act of 1881 are fully set forth in a report to the Chamber of Deputies, on which the law of 1893 was based, drafted by M. Jules Siegfried, in behalf of a Commission appointed for the purpose. ("Rapport sur la Marine Marchande, Chambre des Députés," No. 2118, 1892, p. 87.) M. Siegfried says :—

"So far as French shipbuilding is concerned, the results of the Act of 1881 have not been favourable. . . . On the average we estimate that an ordinary steamship in England costs 300 francs (\$60) per gross ton, while the same vessel costs 420 francs (\$84) in France. . . . Without this Act our shipyards would have completely disappeared. Our average annual expenditure of 2,679,766 francs (\$535,953) for the last ten years has not been wasted. It has only been insufficient; steel and iron plates cost in England 15 francs per 100 kilogrammes, against 23 to 25 francs in France, while the price of their coal is much below ours. Undoubtedly labour is much cheaper in France, where fitters and rivetters are paid from 5 to 6 francs a day, while in England they earn an average of 12 to 15 francs; but the British workman, usually paid by the piece, turns out a large amount of work, and thus by efficiency compensates in great measure for the difference in wages. . . . Experience shows that the construction bounty of 60 francs a ton under the law of 1881, even with the aid of a large navigation bounty for vessels built in France, has been insufficient."

A lamentable confession this. Accordingly, in January, 1893, the bounties were increased by a sum estimated at \$600,000 a year. By Article 4 of the Act of 1881, the bounties on construction were given "as compensation for the increased cost which the customs tariff imposes on shipbuilders." Navigation bounties

were, according to Article 9, "by way of compensation for the obligations imposed on the Merchant Marine for recruiting and assistance to the Navy."

The bounties for construction are as follows :--

	1881. Net Ton.	1893. Gross.
Iron and steel vessels	60 francs.	65 francs.
Wooden vessels	10'20 "	30'40 "
Engines, per 100 kilos. . . .	12 "	15 "
New boilers, per 100 kilos. . . .	8 "	15 "
New parts of repairs, per 100 kilos. . . .	. . .	15 "

The Act of 1893 applies only to sailing vessels over 80 tons and steamers over 100 tons gross. An additional navigation bounty of 25 per cent. is awarded to vessels suitable for service in war. Foreign-built vessels receive no bounty. Four per cent. of the navigation bounties are retained for the benefit of sick seamen. Subsidised mail steamships must be built in France, but they receive no navigation bounties. Any vessel receiving navigation bounties is bound to perform, free of charge, any postal service entrusted to it by the Government, and to carry free postal agents. In the Merchant Marine the captain, officers, and at least three-fourths of the crew must be French. The navigation bounties are as follows, but they only apply to vessels in distant foreign trade (*long cours*). Coasting vessels receive no bounty. A yearly decrease in the bounty is provided to correspond approximately to the deterioration of the vessel.

	Francs.	Annual Decrease.
Steel or iron steamships, for each 1000 miles traversed, per gross ton	1'10	0'04
Wooden steamships	1'10	0'06
Steel or iron sailing ships	1'70	0'06
Wooden sailing ships	1'70	0'08

During the nine years, 1882-90 inclusive, the French Government paid in bounties to shipping about nineteen million dollars (navigation bounties, \$13,875,550; construction bounties, \$5,171,950), or an average of \$2,100,000 annually. Yet the total tonnage of France is less than it was before the Act of 1881; the total construction in French yards for nine full years of the Act has been only 15,000 tons larger than for nine years before the Act was passed; the purchase of vessels abroad for the French flag has been over 30 per cent. greater than before the Act of 1881 was passed, and the number of French-built vessels taking advantage

of navigation bounties has fallen off. The facts do not show on the face any substantial general gains to France from the adoption of the bounty system, but it has doubtless been a direct benefit to some individual shipowners.

Of the 944,013 tons of shipping owned by France in 1890, 370,000 tons received navigation bounties, and 180,000 mail subsidies.

"La Compagnie Générale Transatlantique" at first went to the Clyde for their boats, which were iron paddle-wheel ships, built by Scott & Co., of Greenock. Owing to the heavy duties placed by the Government on foreign-built ships, the company induced Messrs. Scott to establish a building-yard at St. Nazaire, on the west coast of France, but it was not a success, and ultimately the company assumed the yard and built most of their own ships. They, however, find it impossible to build boats in France as cheaply as in Britain, even with the aid of the Government bounties of \$12 to \$13 per ton; but their present mail contract compels them to build in the former country.

They soon abandoned paddle boats for screws. Among the latter were *La Canada*, *L'Amérique*, *Labrador* and *La Ville de Havre*, fine boats of about 2000 tons, running between Havre and New York. Ten years ago the company decided to build five fast boats to compete with the British and German boats. These were—

	Feet.	Tons.	I.H.P.
La Normandie . . .	459 × 49 × 37	6,217	7,000
La Bourgogne . . .	492 × 52 × 38	7,303	8,100
La Gascogne . . .	492 × 52 × 38	7,303	8,100
La Bretagne . . .	492 × 51 × 36	6,900	8,100
La Champagne . . .	492 × 51 × 36	6,920	8,100

The first named was built at Barrow-in-Furness; the second and third at La Seyne, near Toulon; the fourth and fifth at St. Nazaire. They have six cylinder, compound, three-crank engines, and average about 17 knots at sea, making the passage to and from Harve in about 8 days, and sometimes less. They have done their work well, enjoying most of the traffic between New York and Paris, Italy and Switzerland, and carrying the French mails. They are beautifully decorated, and fitted with every luxury; but they do not suit the British taste, inasmuch as no notice is taken of the Sabbath day, while on board British ships Divine service is always held at 10.30 A.M., and it is often very impressive. The cuisine, wines, and attendance are excellent. In 1891 the company added a new and more powerful boat, named

La Touraine, a twin screw, $520 \times 56 \times 34\frac{1}{2}$, 8740 tons, 12,000 I.H.P., which reduced the passage from Havre to Sandy Hook to less than 7 days, and in July, 1892, she made it in 6 days 17 hours 30 minutes, the fastest on record between these ports: as the distance run was 3171 knots, it was equal to 5 days 21 hours from Queenstown, the average speed being 19.63 knots, and the best day's run 501 knots. In 1893 the company launched from their own yard another fine boat, *La Navarre*, which, however, was sent to Havana and Mexico. It is also stated that the company has recently contracted for two ocean greyhounds, to be named *Alsace* and *Lorraine*, each 557 feet long with 59 feet beam, capable of steaming 20 knots. The company recently tendered to run a line between Havre and Canada, *via* Plymouth; but the



"LA TOURAINE."

proposed speed, 17 knots, did not satisfy the Canadian Government, which required 19, a speed which the directors deemed dangerous.

The boats have met with several serious disasters. On the 22nd November, 1873, the *Ville de Havre*, from New York for Havre, was sunk by collision with the iron sailing ship *Loch Earn*, when 226 persons perished; 87 were rescued by the crew of the *Loch Earn* and transferred to the ship *Trimountain*, which landed them at Cardiff on the 1st December. The *Loch Earn* was abandoned on the 28th November. On a judicial examination the *Loch Earn* was exonerated in England, but censured in France. In 1874 the *Europe* foundered at sea, but no lives were lost. *L'Amérique* broke her shaft and drifted about the Atlantic until she was found by the *Ville du Brest*, sent from Havre for the purpose, a very

remarkable feat of seamanship. *La Gascogne* struck on the Scilly Islands in a fog, but had a marvellous escape, and recently she gave rise to considerable anxiety, her machinery having broken down three times, but it was repaired at sea, and she reached New York unaided, though eight days overdue. There have also been several collisions. In February, 1895, *La Touraine* was sent on a special cruise from New York to the Azores, Lisbon, Gibraltar, various Mediterranean ports, as far east as Alexandria, Jaffa and Constantinople, returning to New York *viâ* Malta, Tunis and Algiers, the saloon fare ranging from \$500 to \$2000, the latter being for one or two passengers in "Chambres de Luxe," with private bath-room.

As usual with French statistics, the company's reports are issued about twelve months late. On the 31st May, 1893, the company owned sixty-six steamships, measuring 172,423 tons gross, with 174,400 I.H.P., running between France and New York, Mediterranean ports, the West Indies, Porto Rico, San Domingo, Haiti, Havana, Mexico, Colon, Liverpool, and in the local coasting trade. The company values its ships very highly in the statement of accounts, no less than \$130 per ton, against \$55 for the Peninsular and Oriental Company; \$65 for the Hamburg-American Company; \$77 for the North German Lloyd Company, and \$87 for the Cunard Company. This total value is put down at 116,541,607 francs (\$23,308,321), and the total assets are valued at 164,513,773 francs (\$32,902,754), which includes the shipyard, plant, real estate, repair shops, stores, debts due, investments and funds on hand. On this valuation the allowance for depreciation in 1892 was only 5,400,732 francs (\$1,080,146), which enabled the directors to pay a dividend of 4 per cent. for the year.

The company's capital is only 40,000,000 francs (\$8,000,000), but its credit appears to stand high in Paris, for it has issued over 96,000,000 francs (\$19,200,000) in 3 per cent. bonds, payable in seventy-one years. It is not stated, however, what they were sold at. It has also capitalised at 6 per cent. annuities due to the old Valery Company, amounting to 4,407,737 francs. The accounts also show a sum of 18,650,285 francs (\$3,730,057) as "Reserve and Insurance funds." The total receipts in 1892 were 58,208,601 francs (\$11,641,720); the total expenditures 51,093,041 (\$10,218,608), and the profits 7,115,560 (\$1,423,112). After deducting 5,400,732 (\$1,080,146) for depreciation and 80,000 (\$16,000) for statutory reserve, the net profits were only 1,634,827 francs (\$326,965), of which the 4 per cent. dividend absorbed 1,600,000 francs (\$320,000). The receipts in round numbers consisted of freight 24,000,000

francs (\$4,800,000); passengers 22,000,000 francs (\$4,400,000); mail subsidies 8,000,000 francs (\$1,600,000); the distance travelled on postal routes being 512,692 marine leagues, and the payment about \$1 per mile on the average, the Havre-New York service receiving higher pay, as higher speed is required. The distance travelled on "free routes" was 248,474 marine leagues.

The average speed maintained was—

	Knots.	Obligatory Knots.
New York route	16'70	15
Antilles „	12'39	12
Mediterranean route	12'72	10'48

Workmen employed in shipyards are as follows :—

	Men.
At St. Nazaire (Penhoet)	2,070
„ Marseilles	580
„ Havre	560
„ Fort de France	75
Total	<u>3,285</u>

BALANCE SHEET COMPAGNIE GÉNÉRALE

	First Cost. Francs.	Balance. Francs.
Fleet, supplies, and equipment	185,693,394	
Depreciation	69,151,787	
		116,541,607
Plant, interest on construction bonds, and cost of issuing 3 per cent. bonds	20,973,588	
Depreciation.	19,095,696	
		1,877,892
Real estate, shipyard, repair shops, buildings, and agencies	21,274,615	
Depreciation.	4,506,220	
		16,768,395
Premium on conversion of bonds.	1,960,914	
Depreciation.	1,960,914	
		135,187,895
Paid on account of <i>La Navarre</i> , etc.		3,398,680
Establishments Paris and Havre, and three shipyards		2,265,008
Coal.		1,061,731
Advances for shipbuilding, etc.		2,064,418
Various debtors	4,453,671	
Balance of insurance reserve from issue of 20,000 bonds, 1885	7,905,273	
		12,358,944
Funds available :		
French Government, current accounts, cash in bank and on hand		8,177,097
		164,513,773

Expenditures and receipts from

	Francs.
General expenses of administration and taxes	422,347
" " Paris and agencies	6,213,730
Crews, coal, oil, dues, insurance, maintenance, passenger service, freight service, tugs, and sundries	39,788,643
Interest and premium on bonds.	4,668,321
Depreciation of marine and other property.	5,400,732
Legal reserve	80,000
Dividend 20 francs, or 4 per cent.	1,600,000
Balance of profit	34,827
	58,208,601

		Francs.
80,000 shares at 500 francs		40,000,000
5 per cent. bonds to be converted or paid off		40,500
3 per cent. bonds (294,240 payable in seventy-one years)		96,681,379
Due Valery Company 220,366·45 francs capitalised at 6 per cent.		4,407,737
		<hr/>
		141,129,616
Sundry creditors		3,099,044
Sundry reserve funds :		
Insurance reserve based on loan of 9,600,000,	Francs.	
July 20th, 1885	15,866,211	
Reserve in 1892	135,352	
	<hr/>	
	16,001,563	
Statutory reserve.	2,648,722	
	<hr/>	
		18,650,285
Net earnings, 1892	7,250,911	
Less total net reserves in 1892, including		
5 per cent. on dividend (1,600,000)	5,616,084	
	<hr/>	
		1,634,827
		<hr/>
		164,513,773

	Francs.	Francs.
Freight, passengers, and mails, viz. :—		
Line from Havre to New York	21,079,451	
„ „ St. Nazaire to Mexico	4,128,484	
„ „ „ to Colon	4,504,601	
„ „ Havre, etc., to Colon	4,598,107	
Colonial lines	909,089	
Mediterranean lines	14,740,003	
Commercial lines and bounties	3,514,621	
Coasting lines (freight)	1,347,517	
	<hr/>	
Incidental receipts, interest on investments, <i>Compte d'ordre</i> , and balance on closed operations		54,821,87
Balance of profit and loss from 1891		3,350,281
		<hr/>
		36,447
		<hr/>
		58,208,601

CHAPTER XXI.

THE NETHERLANDS LINE,

OFFICIALLY known as the "Nederlandsch Amerikaansche Stoomvart Maatschappij," commenced in 1872 a regular passenger and freight service to New York from Rotterdam and Amsterdam.

The company, instead of building their ships, has in recent years bought them from the White Star and other British lines, changing their names; they are, however, very fine boats, and now perform a semi-weekly line to and from Holland *via* Boulogne very satisfactorily. The capital of the company is \$1,680,000, and the line at present consists of thirteen boats, viz. :—

		Feet.	Tons.	
Maasdam	. .	420 × 41 × 31	3,707	<i>ex</i> Republic
Veendam	. .	420 × 41 × 31	3,707	<i>ex</i> Baltic
Schiedam	. .	. . .	2,800	
P. Caland	. .	350 × 38 × 27	2,584	
Rotterdam	. .	390 × 38 × 28	3,329	<i>ex</i> British Empire
Amsterdam	. .	410 × 39 × 29	3,664	<i>ex</i> British Crown
Obdam	. .	410 × 39 × 29	3,657	<i>ex</i> British Queen
Werkendam	. .	410 × 39 × 29	3,559	<i>ex</i> British King
Spaarndam	. .	430 × 42 × 32	4,368	<i>ex</i> Arabic
Zaandam	. .	. . .	3,100	
Edam	. .	. . .	3,200	
Didam	. .	. . .	2,800	
Dubbeldam	. .	. . .	2,800	

The "North American Transport Line," under the British flag, but chartered by Americans, carries on a freight service between New York and Rotterdam every ten days.

CHAPTER XXII.

THE RED STAR LINE.

THE Red Star Line was originally a Belgian company, known as the "Société Anonyme Belge-Américaine," which commenced to run between Antwerp and Philadelphia on the 19th January, 1873, with the iron screw *Vaterland*, 2748 tons, and was followed by the *Nederland* and *Switzerland*, built by Messrs. Palmer on the Tyne. They were the first boats built to carry petroleum in bulk, but as they also carried passengers the authorities imposed such severe restrictions on the former trade that it was abandoned.

In 1878 the *Belgenland* was added, and in 1879 the *Rhyndland*, both built at Barrow; then the company purchased from the Cunard Company three of the latter's fleet, the *Java*, *Russia*, and *Algeria*, and changed their names to the *Zeeland*, *Waesland*, and *Pennland*. In 1883 two fine ships were built for the company by Messrs. Laird Brothers at Birkenhead, the *Westernland* and *Noordland*, and in 1889 their finest ship the *Friesland* was built by Messrs. J. & G. Thomson, of Glasgow. She is a fast single screw of 7116 tons, $450 \times 51 \times 38$, with triple-expansion engines, having cylinders $35\frac{1}{2}$, 56, and 89 inches in diameter and $4\frac{1}{2}$ feet stroke.

Although the ships sail under the Belgian flag, it is understood that they are now owned principally by Americans, and that the International Navigation Company of Philadelphia have a controlling interest in the line. They run weekly between New York and Antwerp, and fortnightly between Philadelphia and Antwerp. The *Friesland*, however, has recently made a trip to the Mediterranean.

In December, 1894, the *Noordland* broke her shaft four hundred miles west of Queenstown, and was towed to that port by the *Ohio*.

CHAPTER XXIII.

THE AMERICAN LINE.

THE only boats now running on the North Atlantic under the United States flag besides the *Paris* and *New York*, which were built in Scotland, and admitted to United States registry under a special Act of Congress, are the *Indiana*, *Illinois*, *Pennsylvania*, and *Ohio*. They were built in 1872-3 by the Cramp Company of Philadelphia for the "American Steamship Company," to run between that port and Liverpool. They are 357 feet long on deck \times 43 \times 24, 3126 tons gross. They were built of iron and had two cylinder compound engines, the cylinders being 48 and 90 inches, with 4 feet stroke, and at 65 lbs. steam pressure developed 2000 H.P., which gave them a speed of about 14 knots. But their cost (about \$600,000 each) was so much greater than British-built boats that they could not compete with them. In 1884 they passed into the hands of the International Navigation Company, who had the saloon accommodation removed, and now employ them in the emigrant and cargo business, in conjunction with the *British Princess*, 3926 tons, and *Lord Gough*, 3655 tons, under the British flag. The company has recently given the four American boats new triple-expansion engines, and have added two very large Clyde-built boats, the *Kensington*, 8669 tons gross, and the *Southwark*, 8607 tons, which are said to be capable of carrying 7000 tons of cargo, besides passengers, but which, owing to the United States registry laws, are compelled to sail under the British flag.

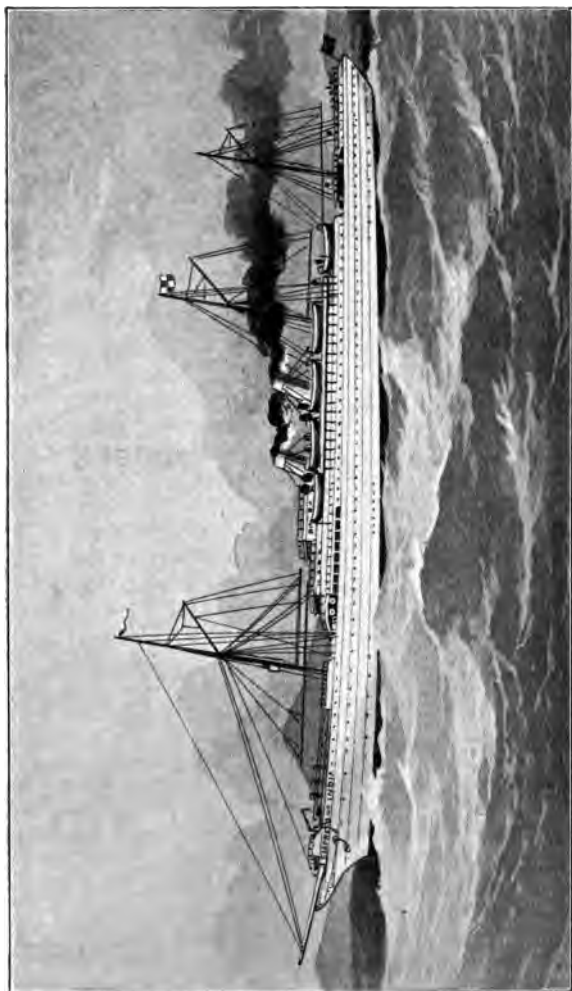
CHAPTER XXIV.

THE CANADIAN PACIFIC LINE,

ALTHOUGH not strictly an Atlantic line, is so intimately connected with Canada, and with the proposed new fast Atlantic line, that it may well find a place in the record.

It consists at present of three magnificent ships, the sole property of the Canadian Pacific Railway Company. They are not only a great advance on the ordinary screw steamship, but a great credit to the Dominion. They were built at Barrow-in-Furness by the Naval Construction and Armaments Company under a contract made in the fall of 1889. The *Empress of India* left Liverpool for Vancouver, B.C. (*viâ* Suez Canal and Hong Kong), 8th February, 1891; the *Empress of Japan* on the 11th April, and the *Empress of China* on the 15th July. They are all alike, $485 \times 51 \times 36$, 5920 tons gross, with twin screws and two sets of triple-expansion engines, developing 10,000 I.H.P., and burning about 1·60 lbs. of good coal per I.H.P. per hour when going at full speed. They are built of steel with very fine lines, and are handsome models; have accommodation for 180 first, 32 second, and 600 steerage passengers, and are capable of carrying 3250 tons of cargo. They were guaranteed to make 18 knots on the measured mile, and $16\frac{1}{2}$ on a 400-mile sea trip, but the *Empress of India* made $19\frac{1}{4}$ on the measured mile; the *Empress of Japan* 18·91, and an average of 17·85 knots on a 400-mile trial at sea, consuming only 1·56 lbs. of coal per I.H.P. per hour, or about 170 tons per day, making 89 revolutions per minute. The *Empress of China* made 19 knots on the measured mile. (The early Cunard boats consumed 4·7 lbs. of coal per I.H.P. per hour to make an average of only 8·3 knots!)

They are fitted with all the latest improvements, with midship saloon, and the cabins and state-rooms are luxuriously furnished, well ventilated, and lighted by electricity. They cost about \$1,000,000 each, or about \$170 per gross ton.



"EMPERESS OF INDIA."

The promenade deck is 250 feet long, 100 feet being covered in, with ample room for exercise. When nearing completion the company advertised cheap "round the world" trips, calling at Gibraltar, Naples, Port Said, Suez, Colombo, Penang, Singapore, Hong Kong, Woosung, Nagasaki, Kobe, and Yokohama, and returning *viâ* Vancouver over the Canadian Pacific Railway, and any line of Atlantic steamships—for \$600. The result was that every berth was taken in all three ships, and the scheme carried to a successful termination, all the passengers expressing their delight with the trip. The first boat, the *Empress of India*, with 141 saloon passengers, reached Hong Kong on the 23rd March, 1891, in 43 days; leaving there on the 7th April, she reached Yokohama on the 16th, having steamed at little over half speed from Liverpool. She left on the 17th, and, although encountering a very heavy gale, reached Victoria, B.C., at 6.30 A.M. of the 28th in 10 days 14 hours 34 minutes. As the distance is 4300 knots, this gives an average of 406 knots per day, or just 17 knots per hour. The time was 2 days 6 hours less than the best previous run. A special train carried the mails and passengers from Vancouver to Montreal, 2906 miles, in 3 days 17 hours 35 minutes, arriving there at 5.56 P.M. of May 2nd—14 days 22 hours from Yokohama, including 10 hours' detention at Vancouver. A mile a minute was made on the prairies, but for 500 miles the route was over mountains, reaching an altitude of 5296 feet above the level of the sea. The average speed was 32 miles an hour, including all stoppages and twenty changes of engine. This feat, however, was surpassed a little later on. The *Empress of Japan* left Yokohama on her second trip on the 19th August, and arrived at Victoria on Saturday the 29th in 9 days 19 hours 39 minutes, or an average of 18.50 knots per hour, beating all records. A special train left Vancouver at 1.8 A.M., and it was determined, if possible, to catch the Inman mail boat which was to leave New York on Wednesday the 2nd September at 5 A.M. The train arrived at Brockville, 2802 miles, on Tuesday the 1st at 9.3 P.M. in 76 hours 55 minutes, allowing 3 hours for difference in time, or an average of over 36 miles an hour. Transfer across the St. Lawrence required 38 minutes, and the New York central train ran from Morristown to New York, 360 miles, in 7 hours 2 minutes, reaching there at 4.43 A.M.; at 5.10 A.M. the mails were on board the *City of New York*, and she arrived at Queenstown at 2 P.M. of the 8th in 5 days 22 hours 55 minutes. The mails were delivered in London on Wednesday morning the 9th in 20 days 9 hours from Yokohama, allowing for difference of time! The official time *viâ* Suez is 43 days. All

England was astonished. The London *Times*, in an editorial, said, "This record is pregnant with untold issues for the future of our Empire." On the continent of Europe, in New York, Boston, Philadelphia, and other cities the event was discussed with fully as much interest. Thus a new era was commenced in Eastern travel. The company has since made arrangements with the Peninsular and Oriental Company and several Atlantic lines which enable them to carry passengers from London, *via* Hong Kong, Yokohama, Vancouver, Montreal, Boston, or New York, round the world, at the low cost of £125 sterling or \$610, including meals and berths on steamships, but not on railways. The traveller has the choice of proceeding eastward or westward, and it may be begun at any intermediate point on the route. 12 months is the limit of time during which the ticket may be used. Deviations from the route indicated can be made at a slightly increased cost, enabling the passengers to proceed overland through India, Egypt, and continental Europe. The one link now missing is the fast Atlantic service to Quebec and Halifax. When this is in operation we may expect to travel from London to Quebec in 5 days 20 hours, to British Columbia in 10 days, and to Japan in 21. The company receives a subsidy of £60,000 sterling (\$300,000) a year for a monthly line between Vancouver, Japan and Hong Kong, three-fourths being paid by the British Government and one-fourth by the Canadian. Each boat is fitted, under Admiralty supervision, to carry 10 powerful guns, and the British Government has the right to their services as transports or cruisers at any time, for which they receive a retaining subsidy of £7312 10s. per annum in addition. On the Canadian Pacific Railway you find dining-cars with first-class meals, polite attendants, splendid hotels *en route*, and at Quebec and Vancouver, while the scenery is among the grandest in the world, and the traveller is surrounded with ever-changing scenes of beauty and interest.

There is also a monthly line of boats running between Vancouver and Sydney, N.S.W., enjoying small subsidies from the Canadian and Australian Governments, at present consisting of the *Warrimoo* and *Miowera*, two fine boats, to which a third will probably soon be added.

CHAPTER XXV.

THE DONALDSON LINE.

MESSRS. DONALDSON BROTHERS, of Glasgow, a firm engaged in the River Plate trade, having a surplus of tonnage, or finding the trade unprofitable, about 1880 resolved to run a weekly line between Glasgow and Montreal. Accordingly they put on the *Colina* of 2001 tons ($319 \times 34'8 \times 25'6$), 265 H.P., built in the Clyde in 1873, the *Titania*, the *Cynthia*, the *Concordia*, and afterwards the *Circe* (formerly the *Glamis Castle*). There was a lack of outward freight, and it was uphill work competing with the Allans, but the rapid increase in the cattle trade helped them materially and led to success. In 1886 they added a fine boat, the *Alcides*, 3345 tons gross ($340 \times 42 \times 22'7$), with 400 H.P., and in the spring of 1890 a larger and faster boat, the *Amarynthia*, (formerly the *Merton Hall*), built at Dumbarton in 1882, and especially fitted for the cattle trade. She is 3931 tons gross ($400 \times 42 \times 29'7$) and 500 H.P. To these they also added the *Warwick*, built at Newcastle-on-Tyne in 1882, 2527 tons gross ($316 \times 41 \times 24'4$), formerly in the Bristol trade. They do not carry many passengers, either outwards or homewards, but they are favourite boats with cattle shippers, and carry many fine horses from the Clyde for western breeders. They, however, met with several serious disasters. The *Titania* was wrecked on Anticosti, the graveyard of the St. Lawrence, and was sold; she was afterwards rescued and repaired by the buyer, being only the second ship on record that has escaped total wreck on that island.

On the 22nd May, 1889, occurred off Longue Point, 6 miles below Montreal, one of the most terrible collisions that has ever happened on the St. Lawrence, between the *Cynthia* bound up, and the *Polynesian* bound down. They were both going at full speed, and through some misunderstanding on the part of the pilots, they met "end on," and the bows of both ships were completely smashed in. The *Cynthia* sank in a few minutes with seven

of her crew, but the bulkhead saved the *Polynesian*, and she reached Quebec, where she was repaired in the new stone graving dock. The Vice-Admiralty Court found the pilot of the *Polynesian* in fault, and condemned her owners to pay for the *Cynthia*.

Then on the 18th July, 1891, the *Circe* struck on Anticosti and broke up. Captain Jennings, the first and second engineers, chief steward, and store-keeper were drowned. She was replaced by the *Indrani*, 3584 tons gross, built at Liverpool in 1888 ($361\cdot8 \times 44\cdot3 \times 27$), and 256 H.P.

In 1893 the *Tritonia*, a very fine new boat, built on the Clyde by Messrs. D. & W. Henderson, was added to the fleet. She has handsome accommodation for passengers amidships, but has been specially designed to carry about 750 head of cattle. She is 4200 tons gross, built of steel, the shell-plating forward being double, to resist the ice. Her dimensions are $377 \times 46 \times 31$, and she has triple-expansion engines with cylinders 26, 43, and 79 inches, and 4 feet 6 inches stroke. They have since added another fine boat, the *Hestia*, to the line. Having a surplus of tonnage in 1894, they ran the *Concordia*, *Alcides*, and *Warwick* between Bristol (Avonmouth) and Montreal, but freights were so low the line does not appear to have paid, and it has now been withdrawn.

In the same year they met with two fresh disasters. The *Amarynthia*, when leaving Montreal on the 26th June, struck on Isle Ronde through the fault of the pilot, and had to be repaired at Quebec; and in November the *Hestia* lost her screw near Anticosti, and was towed to Quebec by the *Derwentholme*, for which the latter was awarded £3000 salvage, the *Escalona*, which had previously towed the *Hestia* 50 miles, receiving £300.

It is now announced that the *Tritonia*, *Alcides*, *Amarynthia*, *Warwick* and *Concordia* will form the weekly line between Glasgow and Montreal in 1895.

Messrs. Robert Reford & Co. are the agents in Montreal.

CHAPTER XXVI.

THE "THOMSON" LINE

BEGAN in a very small way. Mr. William Thomson, of Dundee, an enterprising shipowner, owned some small barques of about 280 tons, the *Deodar*, *Deodara*, *Deodarus*, *Canny Scot*, etc. Gradually he worked them into the fruit, wine and brandy trades, coming twice a year from Marseilles, Tarragona, Denia, Malaga, Cadiz and Charente to Montreal and returning to Britain with grain.

He, too, saw that steam must soon replace sail, and began with a fine little boat, the *Strathhtay*. She was wrecked, and he replaced her with a second *Strathhtay*, which was also wrecked on the north-west reef of Bic in the St. Lawrence, ten minutes after the pilot had left her. With true Scotch perseverance, however, he built at Dundee in 1878 the *Barcelona*, 1802 tons and 190 H.P., and in 1880 the *Avlona*, 1833 tons and 190 H.P., and extended the ports of call to Leghorn for marble, and Naples and Sicily for lemons and oranges, Patras for currants, Valencia and Burriana for oranges, and Bordeaux for wine. Having two sons, he apprenticed one to a marine engineer, and the other to an iron shipbuilder, and thus paved the way for the present firm of William Thomson & Sons. The next ship was much larger, the *Carmona*, of 3000 tons; then came the *Dracona*, 1854 tons and 210 H.P. (284 × 35.7 × 24), and the *Escalona*, a sister boat, in 1884. In 1887 the *Fremona*, 2837 tons and 360 H.P., was added, and in 1888 the *Gerona*, 3056 tons and 420 H.P.—all built at Dundee.

It was soon found that green fruit coming by the cool northern route was landed in much better condition than that by the southern route, and buyers from Toronto, Boston, New York, Detroit, Chicago, and even New Orleans, flocked to the periodical auction sales at Montreal, the Grand Trunk and Canadian Pacific Railroads affording every facility for cheap and rapid transit. The Government also abolished the one per cent. auction duty. Thus it is that the trade has become an important one, profitable to the shipowner, the railway companies and the auctioneer. In the

spring of 1891 it required three large steamships to carry the fruit and wine from the Mediterranean, and a fourth to load wine at Bordeaux and brandy at Charente. To show how the green fruit trade has grown, it is only necessary to say that it was formerly carried on in England by smart little schooners carrying 1000 to 1500 boxes each, and Montreal was supplied with driblets in the ocean steamships from Liverpool. But in May, 1891, the *Gerona* alone landed 52,000 cases in Montreal from Sicily, and in April, 1892, the *Fremona* landed 60,000. The latter boat is now (May, 1895) landing 64,000 boxes, and there are other boats on the way. It is believed that the trade is capable of almost indefinite extension. Oranges were formerly a luxury, sold in Quebec and Montreal at 5 cents each; they are now often sold at 15 cents per dozen. Such are some of the blessings brought about by steam.

When these ships are not employed in the fruit and wine trade they form a fortnightly line between Montreal and Newcastle, calling at London, Dundee or Aberdeen to land cattle.

They have not escaped disaster. The *Avlona* broke her shaft and was towed to St. John's, Newfoundland. She afterwards struck on Berthier Shoal, near Quebec, and filled, but is still running. The *Carmona* left Barrow with steel rails for the U.S. in winter, and never reached her destination. The *Escalona* grounded near Portneuf, above Quebec, and filled, but was easily repaired. The *Barcelona* struck on Red Island, was condemned and sold, but was rescued, repaired by the purchaser, and is still running; and the *Gerona* went ashore on the East Coast of Scotland, but was got off and repaired.

None of these vessels, however, had perishable cargoes, so that the fruit trade was not affected. All these boats were built and engined by Messrs. Gourlay, of Dundee.

In 1892 Messrs. Thomson had built at Barrow the *Hurona*, 3432 tons gross ($360 \times 44.6 \times 26.3$), 500 H.P.; said to be capable of carrying 5000 tons dead weight, and 945 head of cattle. She has condensers capable of giving 8000 gallons of fresh water daily, double bottom, telescopic masts, and stockless anchors, with improved quarters for cattlemen. In the same year they built at Dundee a similar ship, the *Iona*, 3344 tons gross and 500 H.P., which will carry, including those on the shelter deck, 1200 head of cattle; special arrangements have been made in both ships for ventilation of their 'tween-decks. Their maximum speed is about 14 knots.

Messrs. Robert Reford & Co. are the Montreal agents for the line.

CHAPTER XXVII.

THE TEMPERLEY-ROSS LINE.

MESSRS. TEMPERLEY, CARTER & DARKE long owned several sailing ships trading between London and Montreal, the best known being the *John Bull*. Mr. Carter was formerly a member of the firm of Carter & Bonus, of London, who owned a favourite Montreal trader, the *Great Britain*, Captain Swinburne. She was followed by the *New Great Britain*, and she in turn was succeeded by a third *Great Britain*, Captain Wilson, which once carried troops from Quebec to Fort York, Hudson's Bay. Ultimately she had to give way to steam, and in 1871 Messrs. Temperley built at Dumbarton and elsewhere the *Thames*, *Scotland*, and *St. Lawrence*, and afterwards the *Medway* and *Gamma*. The *St. Lawrence* was wrecked at South Africa, on a voyage to the Cape, and the *Medway* in the Straits of Belle Isle.

Then Messrs. Temperleys joined Messrs. Wm. Ross & Co., of London, who provided the *Erl King*, 2193 tons, 250 H.P., the *Viking* and the *Ocean King*, 2449 tons, 450 H.P. The *Viking* was wrecked on Anticosti, and Messrs. Temperley having dropped out of the business, Messrs. Ross & Co. added, in 1890, two fine boats, the *Norse King* and the *Storm King*, which ran to London with the *Erl King* and *Ocean King*. They did not cater for passengers, but the boats, especially the new ones, were admirably fitted for the cattle trade. The *Storm King* was built at Middlesborough, is 3279 tons gross ($340 \times 42.7 \times 26.2$), with triple-expansion engines, cylinders 28, 44, and 72 inches in diameter, 450 H.P. and 2280 I.H.P. The *Norse King* was built at Sunderland, is 2985 tons gross, and 450 H.P.

As outward freight from London is limited in quantity, they sometimes fill up at Antwerp.

The recent death of Mr. William Ross, the head of the firm, will probably cause the company to be wound up, and the boats transferred to other routes.

Messrs. Robert Reford & Co. were the Montreal agents.

CHAPTER XXVIII.

VARIOUS LINES.

IN 1866 a Boston firm built two large wooden screw steamships for the Liverpool trade, the *Ontario* and the *Erie*, but after making a few voyages they were withdrawn.

The only other line attempted by Americans since the failure of the "Collins" line in 1858 (besides the *New York* and *Paris*, built in Scotland), was commenced in 1871 at Philadelphia. The American Steamship Company in that year gave an order to the Cramps to build four iron screw steamships for the Liverpool trade, the *Pennsylvania*, *Indiana*, *Illinois* and *Ohio*. They are each 3126 tons gross ($343 \times 43 \times 24$), with compound engines which developed about 2000 I.H.P. and gave them a maximum speed of about 14 knots. The *Pennsylvania* opened the line in 1873, and for a time they had a fair share of the Atlantic trade, but they cost so much more than British boats (about \$600,000 each) that they could not compete successfully. In 1884 they were taken over by the International Navigation Company of the same city, their saloon accommodation removed, and triple-expansion engines substituted for the old compound. They now run in the freight and emigrant business in connection with the *British Princess* and *Lord Gough*, two boats under the British flag. The builders of the four boats say, "for more than two decades, they have had the melancholy distinction of being the only merchant steamships to show the Stars and Stripes regularly in the ports of Western Europe. . . . They succumbed at length to the competition of their subsidised British rivals." The truth is, however, that no freight boats were ever subsidised by the British Government, nor are they now.

In 1872 Mr. Mark Whitwill, of Bristol, formed a second "Great Western Steamship Company" at that port, and started with a small boat named the *Arragon* to run to New York. The company afterwards built or bought the *Great Western*, *Cornwall*, *Somerset*, *Devon*, *Bristol*, *Gloucester*, *Dorset* and *Warwick*, forming a weekly

line, with occasional boats to Montreal. Owing to the difficulty of navigating the narrow tortuous little Avon, the boats were too small to pay, and when hard times came, they were sold at a heavy loss. In 1873 the "South Wales Atlantic Steamship Company" was formed at Cardiff to run between that port and New York. They built two boats, the *Glamorgan* and *Pembroke*. The Marquis of Bute was one of the largest shareholders, but although they paid no dock dues and the Marquis supplied them with coal gratuitously, they only ran two years.

In the same year the State Line was formed at Glasgow to run between that port and New York, calling at Larne. The boats were very fine ones, chiefly built by Robert Napier & Sons, but after struggling for seventeen years, the line collapsed, and the boats passed into the hands of the Allans.

In 1875, Messrs. Warren, originally a Boston firm, established a line of screw steamships to run between Liverpool and Boston, and purchased two of the Guion Line boats, the *Manhattan* and *Minnesota*, and gave them new compound engines; they afterwards added some fine boats, such as the *Iowa*, *Kansas*, 5276 tons, and *Michigan*, 4917 tons, all fitted specially for freight, fresh beef, and cattle. The ships belonging to the British and North Atlantic Steam Navigation Company also sail under the Warren flag, such as the *Norseman*, 4442 tons, the *Roman*, 4559 tons, the *Cambroman*, 4920 tons, the *Ottoman*, 4843 tons, and the *Angloman*, 4892 tons. The Warrens have also added two fine steel boats, the *Sagamore*, 5036 tons, and the *Sachem*, 5204 tons, and they own one of the oldest steamships now running on the Atlantic, the *Palestine*, built by Steele, of Greenock, in 1858, thirty-seven years old!

In the same year (1875) the great steam shipping firm of Wilson, of Hull, who had long been engaged in the Baltic trade, commenced to run boats between Hull and New York, the names of which all end in the letter "o." In 1884 they first put into an Atlantic steamship, the *Martello*, triple-expansion engines having cylinders 31, 50, and 82 inches diameter, with 4 feet 9 inches stroke. They have since joined another line and unitedly run their boats to London, Antwerp, Hull and Newcastle; some of their boats are over 4000 tons, such as the *Buffalo*, 4431 tons, *Colorado*, 4220, and *Francisco*, 4604.

In 1876, another company determined to compete for a portion of the Boston trade. This was the Leyland Line, which succeeded the well-known firm of Bibby, Sons & Co. in the Mediterranean trade. The line has been a success, mainly, no doubt, owing to the superior quality of their ships, for they have nearly all been

built by Harland & Wolff, on much the same lines as the "White Star" freight boats. The first six boats were the largest built for the Mediterranean trade, refitted with compound engines. In 1888 they added a larger boat, the *Bostonian*, 4473 tons, 500 H.P.; in 1890 they added two very fine boats, the *Georgian* and *Columbian*, each 5088 tons gross ($442 \times 45 \times 31$) and 500 H.P.; and in 1891 two more, the *Lancastrian* and *Philadelphian*, each 5120 tons gross, same dimensions and power as the two previous boats. They are said to carry 7000 tons of dead weight cargo each, in addition to 1000 live cattle; they have also refrigerated chambers for fresh meat, and can make the passage in about nine days. On the death of Mr. Leyland in 1893, the line was converted into a limited company.

When the Avonmouth Docks were opened, nine miles below the city of Bristol, the Great Western Company transferred most of their boats to the new docks, which caused considerable feeling among the denizens of the ancient city. Accordingly, in 1878, Messrs. Charles Hill & Sons, large Bristol shipowners, started the City Line to run between New York and the old city's floating harbour. The citizens had spent a good deal of money in straightening their crooked little river, so it was found possible to bring up boats of about 2000 tons to the city. Their first boats were the *Bristol City*, *New York City* and *Bath City*, of about this size; the line now consists of the following boats:—

	Tons.	H.P.
Brooklyn City	1,726	180
Llandaff City	1,936	200
Boston City	2,334	200
Jersey City	1,936	200
Exeter City	2,198	200
Kansas City	3,679	—
Wells City	1,814	200
Chicago City	2,324	230

Whether the *Kansas City* reaches the old harbour is unknown to the author. Such small boats must have a hard struggle in competition with the new freight boats carrying 7000 tons.

In 1879 Denmark started a line between Copenhagen and New York, known as the Thingvalla Line, calling at Christiania in Norway. At present it consists of the following boats:—

	Tons.
Thingvalla	2,524
Norge	3,359
Island	2,844
Hekla	3,258
Amerika	3,867

The *Amerika* is the former White Star boat *Celtic*, sold to the Thingvalla Company in 1893. This line came into great notoriety in 1889, through the sinking of one of their boats in mid-ocean, the *Danmark*. She had on board 735 souls, 669 passengers (including 65 young children), and a crew of 66 men. On the 5th April she was sighted by the British steamship *Missouri*, Captain Hamilton Murrell; and on the 6th, although a heavy sea was running, by an act of heroism almost unparalleled, this brave man threw some of his cargo overboard, and in four and a half hours saved every soul by means of boats and lines, landing part at St. Michael's (Azores), and the rest at Philadelphia.¹

In the next year (1880) Messrs. W. Johnston & Co. started a line between Liverpool and Baltimore, principally for freight and live cattle. They afterwards started another line between London and Baltimore, and in 1894 a third line running between Liverpool and Montreal. Among others they own the *Baltimore* (3730 tons), the *Barrowmore* (3716), the *Mentmore* (3405), the *Nessmore* (3307), the *Parkmore* (3318), the *Queensmore* (3792), the *Rossmore* (4360), the *Sedgemore* (4332), and the *Castlemore* (2868). The *Rossmore* is 400 × 46 × 29'6, and with engines of only 500 H.P. is said to be capable of making 12 knots. She can carry 6800 tons of dead weight cargo, and is fitted for 1225 live cattle.

In 1881 the Monarch Line, under the official title of the "Exchange Shipping Company, Limited," was started to carry on a regular passenger and cargo service between London and New York. The first boats were the *Assyrian Monarch*, *Lydian Monarch*, *Grecian Monarch*, *Persian Monarch*, etc., fine boats of about 4000 tons gross. In 1887 the line collapsed, and after being laid up for some time the boats were sold to the Allans and the Wilson Line.

In the same year (1881) the Hill Line was started also to run between London and New York. They were the first twin screws placed on the North Atlantic. The *Notting Hill* was built of steel on the Clyde, 3920 tons (420 × 45 × 26½). She was followed by the *Tower Hill*, a similar boat. In 1882 the *Ludgate Hill*, 4063 tons (420 × 47 × 26), was added, and in 1883 the *Richmond Hill*, a sister ship, both built on the Clyde. The two latter now run with the *Lydian Monarch*, 3987 tons, and the *Alecto*, 3607 tons, built in 1893. Mr. W. B. Hill, of Liverpool, is the manager.

The Furness Line, owned by Sir Christopher Furness, of West Hartlepool, has a number of boats running to Halifax and Boston

¹ See Appendix No. 9.

from various ports in Britain, such as the *Durham City* (3092 tons), *Stockholm City* (2686), *Carlisle City* (3002), etc.

In 1886 Americans started two Atlantic freight lines, the boats being built in Britain, and sailed under the British flag, in consequence of United States laws.

"The Atlantic Transport Line" consists of fine large screw boats, chiefly twin screws, running between London and New York, Philadelphia, and Baltimore. Most of them were built at Belfast, viz.—

	Tons.	H.P.
Manitoba	5,672	600
Massachusetts	5,673	600
Mohawk	5,658	600
Mobile	5,780	600
Montezuma	5,504	375
Mississippi	3,732	375
Michigan	3,722	375
Minnesota	3,216	320
Montana	2,775	300
Maryland	2,773	300
Missouri	2,845	280
Maine	2,780	280

The other line is known as the "Manhanset Line," running chiefly from Bristol and Swansea to New York and Baltimore, viz.—

	Tons.	H.P.
Manhanset	2,684	350
Mohican	2,728	350
Monomoy	2,783	350
Massasoit	2,783	350
Massepequa	3,026	350
Menantic	3,024	350

The "Lord Line," consisting of the *Lord Londonderry* (2409 tons) and five other boats, runs between Baltimore and Belfast every ten days, and the Ulster Steamship Company run the *Innishowen Head* (3050 tons) and three other boats twice a month between Belfast and Montreal;

There are, too, several other continental lines running, viz., the Union Line, a fortnightly passenger and freight service between Hamburg and New York, the *Amalfi*, *Marsala*, *Taormina*, and *Sorrento*;

The "Nouvelle Compagnie Bordelaise," running the *Château Lafitte* and the *Panama* between Bordeaux and New York monthly;

The "Compagnie Nationale de Navigation de Marseille," running

the *Cachar* and seven other boats between Marseilles and Naples and New York ;

The "Cyprien Fabre Line," running the *Alesia* and five other boats on the same route ;

The "Navigazione Generale Italiana Line," running the *Entella* and five other boats fortnightly between New York, Gibraltar, and Genoa. This company owns 105 steamers of 171,174 tons gross, and was organised in 1881 by the union of the Florio and Rubattino companies. They run all over the world ;

The "Linha de Vapores Portuguezas," a Portuguese line, running between New York and the Azores, Oporto, Lisbon, and Cadiz ; and

The "Empresa Insulano," another Portuguese line running every six weeks between New York and the Azores, Cape Verde Islands, Canary Islands and Lisbon.

The "Neptune Line," a weekly freight line, running between Baltimore and Rotterdam, consisting of the *Urbino*, *Ohio*, *Patapsco*, *Chicago*, *Venango*, and *Delano*, under the British flag.

Then there is the "Chesapeake and Ohio Steamship Company," an American line, but running under the British flag, the *Rappahannock* and five other boats every ten days between Newport News, Va., and London and Liverpool.

Finally, there are five petroleum vessels, running under the French, Dutch, and British flags, carrying petroleum from Philadelphia to France and Antwerp ; and there are also a number of small Norwegian boats engaged in the fruit trade between the United States and West Indies.

CHAPTER XXIX.

THE WORLD'S TONNAGE.

IT is difficult to give a strictly accurate estimate of the world's tonnage. There is no uniformity in the returns given by the various maritime nations; some give net tonnage and some the gross; some omit all vessels under sixty tons, some all under twenty-five tons, some all under six tons, while with France all above two tons are included. Then the United States include inland river and lake craft, and canal barges, while Great Britain does not. Again, mere tonnage is misleading as to carrying capacity, for it is now generally admitted that the efficiency of steam tonnage as compared to sail is about three and a half to one. It is therefore necessary to keep steam and sail tonnage apart.

Both "Lloyd's Registry" and the "Bureau Veritas" publish accurate annual returns, but the minimum tonnage recognised by both is considerably higher than the official return of any nation. Neither society takes cognisance in its statistics of steam vessels of less than 100 tons. "Lloyd's" omit all sailing vessels of less than 100 tons, but the limit of the "Bureau Veritas" is 50 tons.

As, however, "Lloyd's" last return is much later than any other (dated 2nd July, 1894), it will best serve as a comparative test, the reader bearing in mind the facts above stated. Applying these tests, it shows that more than one-half the tonnage of the world is under the British flag: about 63 per cent. of all the steam tonnage, 52 per cent. of steam and sail combined,¹ and that estimating one ton of steam tonnage as equal in efficiency to three and a half tons of sailing, 58 per cent. of the world's tonnage is British. The most remarkable increase is seen in Norwegian tonnage. Since the repeal of the British Navigation Laws in 1849 (only forty-five years), it has increased over 600 per cent.

THE WORLD (1894).
(100 tons and upwards).

	Vessels.	Net Tons.	Gross Tons.
Steam	12,907	10,111,769	16,066,202
Sail	17,814	8,503,294	8,503,294
Totals	<u>30,721</u>	<u>18,615,063</u>	<u>24,569,496</u>

¹ See Appendix No. 4.

WOODEN.

	Vessels.	Tons.
Steam	1,003	360,419
Sail	15,237	5,462,438
Total tons		5,822,857

IRON.

Steam	7,238	7,661,124
Sail	1,703	1,814,267
Total tons		9,475,391

STEEL.

Steam	4,502	7,986,235
Sail	759	1,142,750
Total tons		9,128,985

LEADING NATIONS.

(100,000 tons and upwards.)

	Steam (gross).	Sail.	Total.
1. Great Britain and Ireland. British Colonies	9,307,783 530,570	2,499,227 632,371	11,807,010 1,162,941
Total British	9,838,353	3,131,598	12,969,951
2. United States ¹	887,766	1,283,693	2,171,459
3. Germany	1,214,830	569,895	1,784,725
4. Norway	403,813	1,265,274	1,669,087
5. France	891,720	197,820	1,089,540
6. Canada ²	241,772	670,767	912,539
7. Italy	318,706	453,053	771,759
8. Spain	449,044	98,314	547,358
9. Sweden	226,769	271,235	498,004
10. Russia	229,542	247,130	476,672
11. Holland	307,145	130,034	437,179
12. Greece	134,687	208,755	343,442
13. Denmark	198,577	134,654	333,231
14. { Austria- Hungary }	222,348	80,270	302,618
15. Turkey	71,358	194,994	266,352
16. Japan	174,466	21,889	196,355
17. Brazil	110,068	35,908	145,976
18. Belgium	117,289	1,538	118,827
19. Portugal	62,811	42,448	105,259
20. Chili	43,741	58,458	102,199

¹ United States return omits lake and river craft, and canal barges.² Canada's return includes vessels under 100 tons.

An official return gives the following figures, showing the progress of steam tonnage in the United Kingdom :—

	Sail.	Steam (net).	Total (net).
1850	3,396,639	168,474	3,565,113
1860	4,204,360	454,327	4,658,687
1870	4,577,855	1,112,934	5,690,789
1880	3,851,045	2,723,468	6,574,513
1890	2,936,021	5,042,517	7,978,538
1892	3,080,272	5,564,482	8,644,754

The "Bureau Veritas" publishes the following returns :—

TOTAL NUMBER AND TONNAGE OF STEAM VESSELS (OVER 100 TONS)
AND SAILING VESSELS (OVER 50 TONS), 1893.

	Steam Vessels.	Tons (gross).	Sailing.	Tons.	Potential Tonnage.
The World . . .	10,629	15,134,436	29,756	9,829,063	62,799,589
British	5,694	9,383,361	9,277	3,574,847	36,416,611 or 58 per cent.

CHAPTER XXX.

BRITISH SEAMEN.

SEEING that the British people are islanders, and consequently dependent on seamen, not only for protection, but for daily food, their treatment in the past has long been a reproach to the nation. Prior to 1850 the British seaman had really no protection of any kind. Badly fed, badly housed, and necessarily subject to severe discipline at sea ; shut out from intercourse with the world for the greater part of his life, and brutalised by the utter lack of mental, moral, or religious stimulus ; the prey of " crimps " ashore, who robbed him of his earnings, and pocketed his " months' advance " before they would let him go to sea again ; deprived of all his earnings in case of shipwreck, and severely punished if he failed to carry out his agreement—his lot was indeed a hard one. The old " forecastle " in the " eyes " of the ship was either cold and damp from leaks in the deck, or insufferably hot from lack of ventilation, overrun with rats, dark and filthy. The food was salt pork, salt beef, and hard bread, and the water often undrinkable, leading to the dread disease known as " scurvy ; " a medicine chest with a few drugs handled by an ignorant captain was all he had to rely on in case of sickness, and deckloads of timber often drove him to the " tops," where he perished slowly from hunger and thirst. The Act of 1850 was the first serious attempt to ameliorate his condition. It established local " marine boards " at the principal seaports of the kingdom, partly nominated by the Board of Trade, and partly elected by shipowners. These boards appointed examiners, to test the qualifications of masters and officers, and shipping masters to protect seamen ; the latter superintend the engagement and discharge of seamen, taking care that they are justly dealt with and receive a proper " discharge ; " see that the nature and length of the voyage is defined, the rate of wages fair, a proper dietary scale inserted, and only legal fines imposed. The Act also provided for sufficient space on board the ship ; such space to be kept free of stores, to be properly constructed and well ventilated.

The shipowner is also bound to provide a supply of medicines in

accordance with a scale sanctioned by Government, with limejuice in certain cases to prevent scurvy, and fresh vegetables whenever they can be conveniently obtained. But it was the great "Mercantile Marine Act of 1854" (17 & 18 Vict. cap. 104), with its 548 clauses, that formed the Magna Charta of British seamen. It embodied the Act of 1850, and, together with its numerous amendments, did much to improve their condition. It established enquiries into wrecks; it refers to the prevention of accidents; requires all sea-going vessels to be provided with a certain number of boats, and lays down rules for the use of lights, fog signals, etc. By this Act, too, and subsequent amendments, savings banks and money-order offices were established; "crimping" was severely repressed; seamen's wages were recoverable up to the date of wreck; deckloads of timber in the fall were abolished; unseaworthy ships were stopped, surveyed and, in some cases, condemned, and various regulations were made to ensure the seaman's health; the coastguard has been supplied with the rocket apparatus which has saved many lives, and the lifeboat service has been extended and improved.

There can be no doubt, too, that the general introduction of iron steamships in lieu of sailing vessels, has improved the accommodation for seamen as well as their diet, especially in steamships carrying passengers. They have greatly increased the risks from collisions, but, on the whole, they have certainly tended towards the diminution of the loss of life at sea. It is to be feared, however, that most of the very large iron sailing ships and many of the smaller cargo steamships are undermanned.

Mr. Plimsoll's wild crusade against shipowners might have done more for seamen if it had been conducted with less of exaggeration and passion. The "Seamen's and Firemen's Union" has done still less for them, for it has been checkmated by the "Shipping Federation," while its "strikes" and attempts at coercion have, to a great extent, alienated the sympathy of the public.

When all is said and done, however, there remains one great reproach attached to the greatest maritime nation in the world. England possesses no national provision either for the training of her merchant seamen,¹ or for the aged and the infirm, or for their widows and orphans. *It is a standing national disgrace.* Nor, with one exception, has any sufficient provision for either been made by shipowners, or the great steamship companies. There is a Seamen's Orphan Asylum in Liverpool, supported mainly by

¹ The abolition of the apprenticeship system was a deplorable mistake.

begging from saloon steamship passengers and voluntary contributions, and a home for aged mariners in Cheshire. There is also the admirable home on the Thames known as the Belvedere, or "Royal Alfred Aged Seamen's Institution," also supported by voluntary efforts; and there are a few training ships for boys and officers. One successful shipowner, Mr. Thomas H. Ismay, of Liverpool, has set a noble example by giving £20,000 sterling as a nucleus for the support of aged and infirm seamen, and the Shipping Federation has started an accident fund for those who are in its employ and refuse to join the seamen's union.

But all these efforts put together do not amount to much. In truth, it ought not to be left to private contributions. It is a national affair, and the national Government should undertake it. Seamen are proverbially reckless as to the future, and make no provision for it. Voluntary contributions from them towards a pension fund have been tried and failed. A moderate compulsory contribution from the 200,000 seamen afloat, aided by a liberal grant from the Government, would be sufficient to wipe away this foul blot, and would not be felt as a burden by any one. The history of the old "Seamen's Hospital Fund" proves the great necessity that exists for some such provision. It was instituted during the early part of the present century for the sole benefit of merchant seamen and their children. It appears to have been founded on the "Scuola di San Nicolo" of Venice, which that city founded in the year 1476 in commemoration of the successful defence of Scutari by the Venetians against the Turks. The British fund was created by compulsory contributions from every British seaman, while employed, at the rate of one shilling per month, and two shillings from shipmasters. The receipts must have been some £7000 or £8000 a month. Yet the claims were so heavy that it became insolvent, and was abolished in 1851. The Winding-up Act transferred its affairs to the Board of Trade for the purpose of paying all existing pensions, and allowing the then existing contributors to continue their annual payments should they wish to do so. It is said to have cost the country over one million pounds sterling.

Nearly every European nation makes some such provision for their seamen. In France all seamen are entitled to a pension after a certain length of service. But these pensions are not really paid by the State, as a deduction of three per cent. is made from the monthly pay of every seaman, and four per cent. of the "navigation bounties" given to French shipowners are retained for the benefit of sick or disabled seamen. One of the best of

these institutions was formed in Norway by a Royal rescript dated 23rd December, 1834. It is maintained by voluntary contributions from seamen and others, by penalties arising from offences of seamen, and by Government aid. The claimants are those seamen who, while employed, contribute regularly to its funds, but seamen who on foreign voyages desert from their ships lose any rights they may have acquired. Shipwrecked seamen also receive aid from the society. Its affairs are managed chiefly by shipmasters. In Germany the "Hamburg-American Packet Company" contributed in 1893 no less than £6000 sterling to the Sick, Invalid, and Retired Seamen's Fund. The "North German Lloyd Company" formed, in 1873, the "Seemanns Kasse" to protect their employes and provide for their families in cases of old age, sickness or death, which appears to have been a success.

In January, 1893, it had a reserve fund of about £100,000 sterling. In 1893 the company also formed a Widow and Orphan Pension Treasury, and contributed to the two societies about 60,000 marks, or £3000 sterling.

But what is the fate of the aged or infirm British seaman? If he meets with an accident there are, no doubt, many splendid hospitals where he is well cared for, and in ancient cities, such as Bristol, there are a few "almshouses" where he may find a refuge in old age. But, as a rule, when he is unfit for further sea service, either by age or by accident, or by his dread enemy rheumatism, he is the most helpless being alive, and there is nothing left for him but the parish "workhouse," with all its horrors, and a pauper's grave. Should he die from accident or disease, his widow and children are thrown helpless on the world, to eke out a miserable existence as best they can. But it is not only the "man before the mast" who thus suffers. Scores of old men may be seen in the leading seaports who have long been respectable shipmasters, but who are now glad to accept a guinea a week, or even less, as night watchmen on idle ships; and when this fails, driven to despair by want, a few of them take a final plunge into the river or the dock, and thus end their careers on earth rather than trust to the tender mercies of "poor law guardians." This is no fancy picture; the author has seen it all in real life and vouches for its truthfulness.

Is this creditable to a mighty nation whose savings are estimated to average 150 million pounds sterling a year, much of it made through the instrumentality of the very men who are thus allowed to starve in their old age? "Shall I not visit for these things? saith the Lord; and shall not my soul be avenged on such a nation as this?" (Jeremiah v. 9).

CHAPTER XXXI.

AMERICAN SHIPBUILDING.

THE decline of shipbuilding in the United States is a remarkable fact. No people in the world are more energetic or more ingenious than Americans. Previous to 1855 their packet ships running between New York, Philadelphia, and Boston, and Europe, were the finest wooden sailing ships in the world, and after the discovery of gold in California, their clipper ships, built specially for that trade, although somewhat weak structurally, were for a time the handsomest and fastest ships afloat. They were, however, soon equalled in fleetness, and surpassed in strength and durability, by the Scotch clippers built at Aberdeen, Glasgow and Greenock. In 1861 the United States owned more tonnage, if we include the lake and river craft and canal barges, than the United Kingdom, and nearly as much as the whole British Empire : thus—

	Tons.
1861. <i>Registered.</i> (Sea-going, steam, 102,608) . . .	2,642,628
<i>Enrolled.</i> (Coasting, lake, river and canal barges, steam, 774,596)	2,839,399
Total.	5,482,027
While the whole British Empire had only . . .	5,895,369
1894. U.S. <i>Registered.</i> (Steam, 266,091) . . .	916,180
,, <i>Enrolled.</i> (Steam, 1,923,349) . . .	3,767,849
Total.	4,684,029

So that in 1894 the United States owned less sea-going tonnage than Norway, and far less, in proportion to population, than the little provinces of Nova Scotia and New Brunswick, in Canada. It is the fashion among Americans to attribute the decay of the American Mercantile Marine to the ravages of the *Alabama*, and a few other southern cruisers, during the Civil War.

But, in truth, the cause lies much deeper. Americans were very slow in realising the fact that the days of wooden ships were over, and for a long time they had no faith in iron ships. Iron and steam, however, rapidly superseded both wooden and sailing ships, but they took little heed of the impending change, and made no preparations to meet it, while Great Britain did. So with steel: a Canadian firm (Allan Brothers) built a steel steamship, the *Buenos Ayrean*, as far back as 1879; but the first American steel ship was only launched at Bath, Maine, on the 10th February, 1894 (the *Dirigo*).

	Tons.
In 1850 the United Kingdom owned steam tonnage only to the extent of	168,474
In 1870 it owned	1,112,934
In 1880 „	2,723,468
In 1892 „	5,564,482
net, or gross	9,383,361
While the United States in 1894 owned in gross tonnage only	2,189,430

Mr. Eugene T. Chamberlain, the U.S. Commissioner of Navigation, however, in his very able report for 1894, attributes the decline mainly to an antiquated registry law, which forbids the registration of foreign-built vessels, and boldly advocates its repeal.¹ He says:—

“The prohibition of registry fails at every point to meet new requirements of trade growing out of the progress which has been made during our century, when man's inventive powers have worked out greater results than during any corresponding period in history. It serves no useful purpose. On the contrary, it has put American enterprise under alien flags and alien laws, given to our commercial rivals control of the established lines of communication by sea between the United States and the old worlds, crushed the traditional American maritime spirit, humbled national pride, and dwarfed our mercantile growth. . . . Years ago all other commercial nations repealed like prohibitions in their laws². . . . The registered tonnage of the United States at the close of the fiscal year 1893-94 was smaller than our registered tonnage half a century ago. . . . Various fanciful causes . . . have been assigned for the decline of American shipbuilding for the foreign trade during the years following 1855. If under any conditions these fanciful causes were entitled to consideration, in the presence of a great industrial fact overriding all statutes and all artificial

¹ At the great convention of Boards of Trade of the United States and Canada, held in Detroit in 1865, the author urged upon Americans, if they wished to enjoy a fair share of the carrying trade of the world, to repeal this law.

² Great Britain repealed a similar law in 1849.

expedients, the substitution of steam for sail as motive power, and metal for wood as material for marine construction, it will be recognised that they are not worth investigation. . . . Every civilised nation, except the United States, long ago abandoned the theory that it could compel by statute its citizens to buy shipping of domestic construction for foreign trade on conditions which forbade its employment in that trade against foreign competition. . . . A registry law cannot prevent the citizen from buying abroad all the ships he chooses. . . . While the registry law has accomplished nothing for shipbuilding, it has stunted the development of American navigation, and must continue to do so until under natural laws the vessels required to compete for the foreign carrying trade can be built as cheaply in this country as abroad. Doubtless the time is not many years distant when we shall build steel steamships better and more cheaply than they can be built elsewhere. But the registry law itself can neither hasten the dawn of that day nor will it effectively retard it."

Mr. Chamberlain also shows that "the actual destruction of our Mercantile Marine wrought by the war was much less than the loss subsequently occurring through the operation of industrial forces which have changed motive power and material of marine construction."

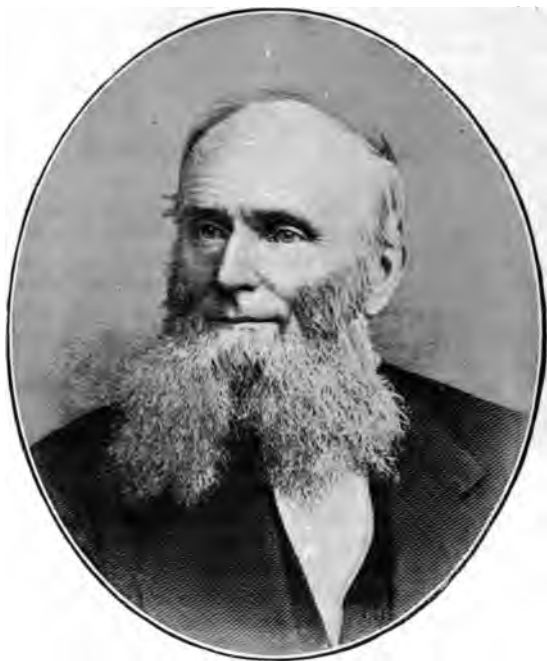
The late William Cramp, of Philadelphia, appears to have been one of the first men in the United States to realise the impending change in marine construction, and to have made any preparations to meet it. But it was not until 1870 that he commenced iron shipbuilding, whereas, as we have seen, Great Britain built an iron steamship as far back as 1821; and in 1843 Bristol launched the first great iron ocean screw steamship, the *Great Britain*.

Mr. Cramp's sons have lately issued a handsome little illustrated volume giving the history of the "William Cramp & Sons' Ship and Engine Company, of Philadelphia," which shows a wonderful development of the business. Beginning in a very small way as a wooden shipbuilder in 1830, Mr. William Cramp commenced iron shipbuilding in 1870, and in 1872 formed the above-named company with a capital of \$500,000. He died in 1879, having built no less than 207 vessels. Since that time much of the work of the yard has been towards the reconstruction of the Navy. The number built, or building, since the death of Mr. Cramp appears to be 75, making the total number 282, and 141 marine engines. Of the 282 vessels, 21 have been United States steam men-of-war, 73 ocean steamers, 22 other steamboats, 54 tugs, and 28 sailing vessels. The company is now completing two ocean greyhounds, the *St. Louis* and *St. Paul*, of 10,700 tons each, to compete with the *Campania* and *Lucania*.

The capital of the company is now five million dollars; the

shipyard, with its accessories, covers a trifle over 31 acres, and it embraces the following structures :—

(1.) A building, 1164×72 feet, containing the joiner and pattern shops, machine and erecting shops, ship-shed, two mould lofts, roll-shop, scribeboard and bending shed.



THE LATE WILLIAM CRAMP, OF PHILADELPHIA,
 Founder of the "William Cramp & Sons' Ship and Engine Building
 Company," builders of the Steamships *St. Louis* and *St. Paul*.

(2.) A boiler shop $387 \times 112\frac{1}{2}$ feet.

(3.) A machine and erecting shop, and the most extensive iron foundry in America.

(4.) A six-story building containing the administrative offices of the company, the construction and steam engineering draughting rooms, and a restaurant.

(5.) A power-house in which are assembled extensive hydraulic, pneumatic and electric plants, whose power is distributed through the shipyards and the shops by means of pipes or wires.

(6.) Five large building slips 600 × 75 feet.

(7.) Five wet docks, having wharfage ranging from 600 to 1000 feet in length.

(8.) A complete railway system connecting with the Pennsylvania and other roads, and penetrating every part of the shipyard and shops.

(9.) About 10 acres of outdoor storage space.

(10.) An extensive pipe shop.

(11.) A brass foundry.

(12.) An ordnance plant fully equipped for the manufacture of breechloading rapid-fire cannon up to, and including, four inches calibre with projectiles.

(13.) A basin, dry dock, and marine railway. The dry dock is 462 × 70 feet, and has a draught of 22 feet on the sill at mean high water. The marine railway is capable of hauling out vessels of 1000 tons register.

(14.) The largest and most powerful floating derrick in the world, capable of lifting 125 tons.

The company employs 5600 men and boys, and its weekly payroll amounts to \$54,000 !

The author of the book, however, (who appears to be Mr. Charles H. Cramp, the president of the company,) indulges in some very severe criticisms of British shipowners and builders, which seem to call for some notice in a work of this kind. He speaks of "ungenerous rivalry," and of the founder of the company, Mr. William Cramp, as being "met at the threshold by the powerful and vindictive rivalry of England, exultant with the strides of progress which our unfortunate civil strife has enabled her to make unopposed ;" and of his first efforts to domesticate iron ship-building on these shores, as being "put forth under conditions that would have appalled most men" (p. 5).

And then, writing of the *St. Louis* and *St. Paul*, he says :—

"Their advent upon the world's highway of the North Atlantic is awaited by the American public with anticipation, and by the English public with apprehension. Since 1861, the period of a generation, the English have enjoyed a monopoly of the ocean traffic of the world, scarcely disturbed by the comparatively feeble efforts of their Continental neighbours, and they have built most of the ships employed by the latter at that. This long reign of undisputed supremacy has bred in the British mind a sense of proprietary right to the sea and of lien upon the carrying trade of the United States, which at

last has become so arrogant that they resent any effort at emancipation on our part as an invasion of prerogative.

"Remembering unkindly the competition of our merchant marine in the old days, the English shipbuilders and shipowners of our time watch the development of a new commercial fleet under our flag with bitter hostility. . . . To all these manifestations of ungenerous rivalry the American answer is simply: 'Wait and see!' The ships will be on the line next summer."

This is strong language, much to be deprecated, and is unsupported by a particle of proof. The author has been associating with British shipowners and builders for forty years, yet never heard of this "vindictive," or "ungenerous rivalry," or of "bitter hostility" on their part towards American shipbuilders or owners, and so long as the United States preserve their present laws, the "apprehension" of British shipowners and builders will not amount to much.

The best comment on these charges is to point out the generous treatment of American shipowners and builders by Great Britain in 1849, and the response it met with. By the Act of that year, repealing the British Navigation Laws, American ships were freely admitted, not only to the great foreign trade of the British Empire, but to the Indian and Colonial trades, and, later on, to the coasting trade, on the same footing as British ships. Not only so, but American-built ships were admitted to British registry. This Act was passed after an assurance, given by Mr. Bancroft, the United States Minister in London, in the following terms: "Universal reciprocity, in the widest sense, is held by the American Government as the only thoroughly appropriate basis for intercourse between two great nations,"¹ and in a conversation with Lord Palmerston and Mr. Labouchere, Mr. Bancroft said, "We are ready to do anything you like; if you can do but little, we must do little; if you can do much, we will do much; if you shall do all, we shall do all."²

And what was the response of the United States Government to this generous act of Great Britain? Not only an absolute refusal to open the coasting trade, or to grant United States registry to British or Canadian-built ships, but a refusal to allow British ships to carry goods from New York or Boston to California, on the absurd plea that it was "a coasting voyage!" As well might the voyage from London to Bombay or Calcutta be called "a coasting

¹ Mr. Bancroft to Lord Palmerston, November 3rd, 1847.

² See speech of Mr. Labouchere, May 15th, 1848, in 'Hansard,' vol. xcvi., p. 1008.

voyage." The author speaks feelingly upon these points, for when visiting the shipyards of Boston and Maine, in the winter of 1853-4, he saw, in many of these yards, ships building for British shipowners. The late Donald McKay, of East Boston, for example, had then three great ships on the stocks for a Liverpool firm, and he afterwards built many more, but no British or Canadian-built vessel has ever been admitted to United States registry except by a special Act of Congress.

Between 1861 and 1880 the author's ships had often to compete with United States ships in England, Bombay, Calcutta, Rangoon, Hong Kong and Peru, yet when, in 1869, he had a ship in New York, and freights to San Francisco were high, he was not allowed to carry a ton of goods between the two ports; and, although he bought four United States-built ships, he has never been allowed to sell a Canadian-built ship to an American shipowner. Is this "generous rivalry?"

Again, when a *majority* of the arbitrators at Geneva decided that Great Britain was liable for 15½ million dollars for damages caused by a privateer, which was owned and commanded by American citizens, and which escaped from British surveillance by a discreditable trick, it was promptly paid; but the Honourable T. F. Bayard, who now so worthily represents the United States in London, has frankly admitted that the sum awarded was more than was fairly due, and the New York *Evening Post* has recently admitted that the surplus is lying in the United States treasury. But when the arbitrators at Paris *unanimously* decided that the United States had illegally seized a number of Canadian schooners on the high seas, detained them until they were rotten and useless, and immured some of their innocent crews in filthy Alaska dungeons, till one of the poor captains became insane and died from his cruel treatment, the United States Congress refused to pay the small compensation assented to by President Cleveland and his Cabinet; and Senator Morgan declares that not a shilling is due or will be paid! Is that American generosity?

There is no "bitter hostility" in Britain to the *St. Louis* and *St. Paul*, and Mr. Cramp may rest assured that they will not only receive a generous welcome there, but that if his company can build better or cheaper ships than can be built by British shipbuilders, they will be purchased and registered as British ships without a "special Act" of Parliament.

CHAPTER XXXII.

CONCLUSION.

THE reader of the foregoing pages must have been struck with the marvellous progress made in steam navigation within the comparatively short space of fifty years. The speed of Atlantic steamships has been nearly trebled, or from 8 to 23 knots, and within the last fifteen years it has been nearly doubled ; the power of marine engines has been increased from 700 to 30,000 I.H.P. ; and the steam pressure in the boilers from 13 to 200 lbs. to the square inch. A pound of coal is now made to do four times the work it once did, and passengers and mails are carried across the Atlantic at the speed of a railway train, without a moment's stoppage. It is now possible for passengers to make a round voyage from London to New York and back in 14 days ; they have been carried from London to Bombay in 13 days, and from Southampton to the Cape in $14\frac{1}{2}$, while the accommodation afforded has attained a luxury never dreamt of in early days.

The philanthropist, however, will ask, "Has all this tended to reduce the loss of life at sea ?" The reply must be in the affirmative. Many predicted that increased speed must produce increased loss of life. The record of the past few years does not bear out this opinion. That modern speed is hard upon machinery no one can doubt. The celebrated *Persia's* engines never made over 17 revolutions per minute, while those of the *Paris* make 89 ; but the great compensating fact is found in twin screws, which unquestionably add very much to the safety of all steamships. It has also been found that three cranks tend to materially reduce the liability to fracture of shafts.

The figures relating to the loss of life at sea issued annually by the British Board of Trade, when given without careful explanation, are apt to mislead. One great calamity, such as recently happened in India, by the loss of a steamship carrying a large number of pilgrims, all of whom perished, may give the impression

that the loss of life at sea is increasing ; and the numerous fatal accidents described in this work may create an erroneous impression as to the perils of the sea.

A very able English periodical, *Engineering*, says :

“ In ten years the number of lives lost has decreased by nearly one-half, and when it is noted that the British fleet has in that period increased from 8·5 to 9·6 million tons, the result is even more favourable. . . . The proportion of lives lost to the total tonnage entering and clearing at our ports has decreased from 4·17 per 100,000 tons in 1880 to 2·06 in 1890. In the case of steamers, the increase in traffic is equal to 43·6 per cent., and yet there is a decrease in the number of lives lost of 28 per cent. In ten years the deaths among masters and seamen from all causes decreased from 23·2 per 1000 employed to 13·1 per 1000.”

These facts are, to a great extent, confirmed by Sir Thomas Sutherland, the Chairman of the great P. and O. Line, who says : “ Though there are fifty thousand more persons afloat than there were fifteen years ago, the absolute loss of life at sea is less than it was in 1879.”

The *Scottish Review* says : “ In 1890 there were nearly two thousand trips made from New York alone to various European ports, and about 200,000 cabin and 372,000 steerage passengers were carried, *all without any accident.*” The late Thomas Gray, of the Marine Department of the British Board of Trade, perhaps the best authority then living on the subject, stated that in the Union Line to the Cape only one passenger had died in twenty years, and that only four seamen died in three years ; that in the P. and O. Line only one seaman had died in their forty vessels in a year, and that during three years not a single passenger had been lost ; that the Inman Line had lost no passenger out of a million, and that only eleven seamen had died in three years ; and that the Cunard Line had only lost nine seamen in three years.

It would be rash to predict what the ship of the future may be like. Great engineers, such as the late Isambard Kingdom Brunel, deem nothing impossible, but they will not stoop to consider the inexorable laws of profitable working. Mr. Brunel built the finest railway in the world, with a 7-foot gauge and 60-ton locomotives ; but the directors were afterwards compelled, by considerations which he despised, to reduce the gauge to 4 feet 8½ inches, at enormous expense. He once asked Mr. Lindsay if the *Great Eastern* would pay. “ Perhaps,” replied Mr. Lindsay, “ as a show ship at Brighton she may, but in no other way,” which disgusted Brunel ; but, as we have seen, Mr. Lindsay was right.

At present the Atlantic "greyhounds," though making a round voyage in 20 days, and carrying an average of 1400 passengers, do not pay. Some of them burn over 5000 tons of coal per voyage, so that the limit of profitable size and power has been reached. The future success of such boats would seem to depend more on economy in fuel than in any increase in size or power. When the cost of electricity is materially reduced we shall probably see it replace coal altogether. In the meantime the consumption of coal is being gradually reduced. Messrs. John Brown & Co., of Sheffield, have introduced a system of induced draught, by which it is said that the number of boilers necessary to generate steam enough for 30,000 I.H.P. may be reduced to little more than one-half.¹ Americans have introduced the system of triple screws in two of their warships, and these will probably be adopted in fast merchant ships.

What has already been done in the way of economy in freight boats of moderate speed may be seen by the recorded feat of the *Tekoa*, belonging to the New Zealand Shipping Company. She is a boat of 4050 tons gross, and 450 H.P. with a dead weight capacity of 6250 tons, and she recently ran from Teneriffe to Auckland, New Zealand (12,059 knots), at an average rate of 10 knots an hour, with a daily consumption of only $21\frac{1}{2}$ tons of coal. Thus she carried a ton of goods a mile with an average expenditure of half an ounce of coal.

Carrying capacity, too, has been vastly increased in two turret boats of a novel design, built by Messrs. William Doxford & Sons, of Sunderland.² The *Turret*, of 1265 tons net register, carries 3200 tons of coal, and her measurement capacity is 157,500 cubic feet, or nearly 4000 tons. The other, the *Turret Age*, of 1362 tons net register, carries 3600 tons of coal, or 160 per cent. over her net register tonnage; the old-fashioned sailing ships carried about 40 per cent.

The work done ashore is almost equally marvellous; thus we learn that the steamship *Gladiolus*, with 2240 tons of cargo (wheat and flour), commenced discharging in Liverpool early one Monday morning, and finished at 2.45 P.M. the same day; and Mr. Maginnis says: "It is no uncommon thing to discharge 4000 tons of inward cargo, and load 3000 tons of outward cargo, and also put on board 2000 tons of coal, in about two working days."³

¹ 'The Atlantic Ferry.'

² See Appendix No. 5.

³ 'The Atlantic Ferry.'

Contrast this with the old style of things, when charterparties stipulated that sailing ships should be discharged at the rate of one keel of coals (21 tons), or one and a half keels ($31\frac{1}{2}$), tons) per working day !

There is, however, just now a craze among passengers for speed, which amounts to a mild form of insanity. There is no real necessity for it, now that we have so many cables working ; and except in a very few cases, a longer sea passage is desirable, both on the score of health and enjoyment.



APPENDICES.

APPENDIX No. I.

CUNARD SS. COMPANY.

LAST SEASON A POOR ONE FOR ATLANTIC LINERS.

London, March 25.—The report of the Cunard Steamship Company for 1894 shows a profit of £94,900. This sum does not equal the full annual depreciation, to cover which £88,000 had to be transferred from the insurance fund to the profit account. The Company thinks the falling off due to the stagnation of business in the United States. The saloon passenger traffic was as good as usual.

Liverpool, March 29.—At the annual meeting of the Cunard Steamship Company, held here to-day, Sir John Burns, the chairman, said that Atlantic shipping during the year 1894 had had a most severe time. The deficiency, as compared with 1893, upon passenger traffic to America by all lines, British and foreign, had been over £1,250,000. He maintained that the Cunard Company had held their own. The policy of building the *Lucania* and *Campania* had been singularly successful, the revenue from saloon passengers having increased £84,000, though the second cabin and steerage traffic had been seriously impaired.

The British companies, he said, were desperately handicapped by the bounties paid to foreign steamships. While the Cunard and White Star lines received a mere pittance for postal work, the American line would, after October next, receive over £3000 per voyage for carrying the mails. Arrangements had been made with the Government by which delay would be obviated at Queenstown on Sundays, when ships would depart early in the morning instead of having to wait for the mails until afternoon. This would ensure their early arrival in New York. With the improvements which were now in progress in the arrangements for landing passengers, Liverpool, he said, would not be disparaged by rival ports. The report of the chairman was unanimously adopted.

APPENDIX No. 2.

U. S. TRADE WITH BRITAIN.

MORE THAN HALF THE U. S. EXPORT AND A QUARTER OF THE
IMPORT TRADE WITH THE EMPIRE*Boston Herald.*

The detailed report of the foreign trade of the United States for the fiscal year 1892 has just come to hand. It shows that the British Empire maintains its old superiority as our best customer. Indeed, in this respect there is no chance for rivalry. Measured as a buyer of American products, it is England first and the rest nowhere. We give below a table exhibiting our foreign trade with the United Kingdom and its outlying possessions, and with the rest of the world. By imports we mean imports of merchandise to the United States, and by exports we mean exports of merchandise from the United States.

	Imports.	Exports.
England	\$130,967,694	\$423,848,515
Scotland	16,635,956	42,694,480
Ireland	8,697,231	32,772,337
Total for United Kingdom	\$156,300,881	\$499,315,332
Outlying British Possessions	90,163,431	80,811,202
Total for British Empire	\$246,464,312	\$580,126,534
Rest of world	580,938,150	450,151,614
Total for world	\$827,402,462	\$1,030,278,148

Speaking broadly, it may be said that of every \$100 worth of merchandise imported into the United States, \$29.79 comes from the British possessions, and \$70.21 from other countries. And of every \$100 worth of merchandise exported from this country, \$56.30 goes to the British possessions and \$43.70 to the rest of the world.

APPENDIX No. 3.

OCEAN TRAVEL IN 1894.

New York Evening Post.

The London periodical *Engineering* publishes some interesting statistics of the traffic of our Atlantic steamship lines. In 1894 there arrived at New York from Europe 879 passenger vessels, 96 fewer than in 1893. The number of passengers shows a greater decline, only one-half the number of emigrants in 1893 appearing on the steamship records for last year. In this way the revenues of the companies per trip were reduced, while low steerage rates prevailed also during the year. The totals compare as below :—

	Number of Cabin Passengers.	Number of Steerage Passengers.
1891	109,023	445,290
1892	120,991	388,486
1893	121,829	364,700
1894	92,561	188,164

Interest centres in the changes in the cabin passengers. For the principal lines these were :—

	Cabin Passengers.		
	1892.	1893.	1894.
Cunard	16,062	18,462	18,362
American	14,069	14,374	13,560
White Star	14,025	13,328	11,520
North German Lloyd	17,749	16,058	12,049
North German Lloyd, Mediterranean service . . . . .	..	2,372	1,840
Hamburg . . . . .	..	13,094	9,594
French . . . . .	..	10,205	7,409
Red Star . . . . .	..	7,013	4,513

The record-breakers of the Cunard Line were not in service in 1891 and 1892, hence the increase in this company's travel is to be ascribed to the popularity of high speed with the public. When we consider the decreases shown by some of the other lines, the American lines have cause for congratulations. Very probably their removal to Southampton helped them, and perhaps gave them some of the North German travel from that port. It should also be remembered that the American steamships were making fast trips in 1892, and hence it is not to be expected that the company would show an increase over 1892 like the Cunard Line. The falling off in transatlantic travel seems to have affected the White Star, the North German Lloyd, the Hamburg, and the French lines about alike.

While the total number of passengers—cabin and steerage—is not much greater for the North German Line than for the White Star or American, and a little less than for the Cunard, the number of trips was nearly double, making the average per trip, of course, much less. Of cabin passengers the Cunard carried 328 per trip on the average, the American 283, and the White Star 221.

The statistics of emigrant passengers are not given with corresponding fulness; yet some facts may be stated. The only line which carried more steerage passengers in 1894 than in 1893 was the American, which increased this class of their traffic from 12,000 to 15,905. The Cunard carryings decreased from 25,000 to 19,175; while the White Star lost heavily, from 13,327 to 11,520. The falling off in emigration bore hard upon the North German Lloyd, for their steamers carried on an average 520 per trip in 1893 and but 190 last year. Four years ago the Hamburg line brought 75,835 steerage passengers from Hamburg, the number steadily declining to but 18,463 in 1894. Six smaller lines included in the first table carried 54,491 emigrants into New York harbour in 1893, and but 24,078 last year.

These figures seem to show that transatlantic travel, when feeling the effects of the business depression, follows the rule which we have seen illustrated in our land industries, namely, that the companies which have an old-established business with good facilities and plenty of capital are able to stand the storm and retain their trade better than the others; and further, that enterprise is a prime factor in success.

APPENDIX No. 4.

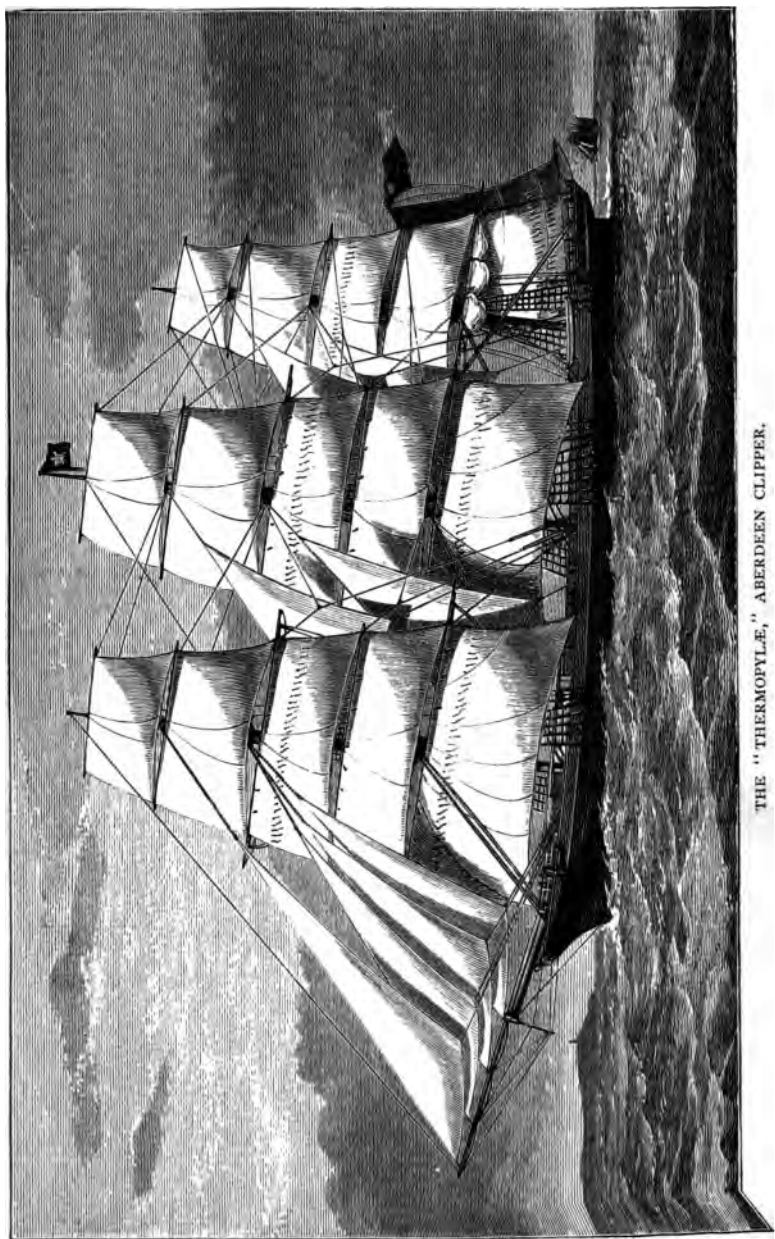
ENGLAND'S COMMERCE.

THE OLD COUNTRY IS STILL THE MISTRESS OF THE SEAS.

Boston Globe.

A good deal is said of the value to a country of the carrying trade of its merchant navy, and of the need of the United States to secure its share, but few Americans realize how urgently statistics plead for wise and prompt legislation in behalf of the United States.

For instance, fifty years ago, England controlled one-third of the carrying trade on the high seas, but now it controls more than one-half, or, literally, possesses 56 per cent. of the carrying power of the world. Its tonnage of vessels increased from 3,310,000 tons in 1840 to 10,230,000 in 1892, or 210 per cent. It has increased steadily, with a greater ratio of



THE "THERMOPYLAE," ABERDEEN CLIPPER.

gain than that of any other country the past ten years, or from 54·3 in 1882 to 56·6 in 1892.

Steamers have superseded sailing vessels meanwhile, with one steamer having four times the carrying power of a sailing vessel of equal tonnage. But on account of the superiority of her steamers and her commercial enterprise, England has yet been the greatest gainer in steamer tonnage. The average of vessels built in British yards for 1890-91-92 is said to be, steam 927,000, and sail 218,000 tons each year.

As a matter of record, in 1892 the carrying power of steamers was 37,810,000 tons, and sailing vessels 11,030,000 tons, with a ratio of gain to the former of 31·7 in 1860 to 77·4, and a ratio of loss to the latter of 68·3 tons to 22·6 tons.

The increase of trade, as naturally would be expected, is most in favour of England. Taking the world's cargoes, according to port entries to be in 1892, 220,190,000 tons, England carried 115,320,000 tons, or 461 tons per seaman.

These and other figures that might be quoted, show that England has 56 per cent. of the carrying power of the world; that the trade between Great Britain and her colonies is growing more rapidly than the commerce of the world; the English seamen carry more merchandise per man than those of other nations, and four times as much as the British seaman of 1860, and that the annual loss of England by shipwreck is only half that of other nations, as compared with tonnage afloat.

APPENDIX No. 5.

A PECULIAR STEAMSHIP.

THE CURIOUS CRAFT AT PRESENT COMING UP THE RIVER.

It is a New Type Altogether—She is a Big Freight Carrier, and can also Earn Big Dividends for the Owners.

One of the most peculiar craft that has ever visited Montreal is now in the river, coming to this port, and she will arrive here to-morrow morning. The steamship is called the *Turret*, and is built to combine the greatest carrying capacity with the lightest possible draught and the smallest expense in running. The *Turret* is coming from Sydney with a cargo of coal for the Dominion Coal Company, and it is in the coal trade between Montreal and the lower ports that she will run. The *Turret* deck type of vessel is an entirely new type. The form and hull is portrayed in the accompanying illustration. It shows the general outline to be much the same as usual, as far as the water line. Just above that point the shell rounds off upwards terminating in an upright turret running from stem to stern of the vessel.

The curved plating is thick and strong, and is the same as that of the hull right up to the turret deck. The turret deck itself is about a third the width of the vessel, and forms the working deck, upon which are fitted the hatches, winches, bridge and other deck erections. The engines are aft, leaving a clear hold from the engine-room bulkheads to the forepeak. There is a short mast forward with a military top for outlook purposes. The stem and forecastle deck are after the usual fashion. The turret deck standing at a height of from 11 feet to 12 feet above the water line, gives greater seaboard, and being narrow, greater stability than the ordinary type, while it serves as a permanent feeder for grain cargoes. The general contour of the hull, with the engines aft, affords the largest possible carrying space, and a single continuous hold, free from obstruction, with a large hatchway, permits of easy stowing and rapid handling of cargo. The *Turret* was launched last November, and since that time has weathered a severe storm on the Atlantic with perfect ease, has traded on the American seaboard for several months, and her first balance shows that she has earned sufficient to pay a return at the rate of 23 per cent. per annum. The *Turret* carries 3200 tons dead weight on a net register of 1265 tons and a draught of 18 feet. Her measurement capacity was 157,500 cubic feet, which is equal to a cubical capacity of 125 feet per net register ton. She is owned by Messrs. Peterson, Tate & Co., of Newcastle-on-Tyne, and was built and launched from the yard of Messrs. W. Doxford & Sons, Sunderland, and patentees of the turret deck. Another steamship of the same type, called the *Turret Age*, has also been launched, and will shortly make her trial trip. The *Turret Age* in general design and appearance closely resembles her sister ship the *Turret*, but is built on finer lines, has more powerful engines, and will probably steam at a higher rate of speed. The *Turret Age* will carry 3650 tons dead weight, or a net of 1362 tons, so that she carries nearly 20 per cent. more dead weight than the ordinary type of the same net register tonnage. The *Turret* will discharge her cargo of coal at Windmill Point.—*Montreal Star*.

The Turrets Pay.

London *Transport* says: "How much depends upon the type in the matter of earning power is shown in the case of the Turret steamers, which have been specially designed to carry a maximum amount of cargo on a minimum net register tonnage. The Turret Steamship Company, Limited, has just announced an interim dividend at the rate of 10 per cent. for the past half-year as the result of the working of their two steamers, the *Turret* and *Turret Age*, and I shall be surprised if that figure at least is not paid for the current half-year. These steamers are chiefly engaged in the Canadian coal trade, for which they have proved peculiarly adaptable, their large hatches and long holds enabling them to give exceedingly quick despatch both in loading and discharging cargo."

APPENDIX No. 6.

PASSAGE RATES.¹

Summer rates are quoted.

May, 1895.

CUNARD LINE.

From Pier 40 N. R. foot Clarkson St., New York, to Liverpool every Saturday. From Liverpool every Saturday, calling at Queenstown both ways. Rates, 1st cabin on *Campania* and *Lucania* \$90, \$100, \$125, \$150; return, \$150, \$225, \$275, to \$315, servants, \$75; return, \$125. 2nd cabin, \$40, \$45, \$50; return, \$75, \$85, \$95. On *Etruria* and *Umbria*, \$75, \$90 to \$175; return, \$125, \$150 to \$315. 2nd Cabin, \$40, \$45; return \$75, \$85, under one year free outwards. Prepaid \$5. On *Aurania*, *Sevria* and *Gallia*, \$75 to \$175; return, \$125 to \$315. 2nd cabin, \$35; return \$70. Steerage, \$15; servants, \$50; return, \$110. Other steamers \$50; return, \$100 and upwards. Servants, \$50; return, full fare. Children under two years free. Summer season, May 1 to July 16. From Liverpool, July 16 to October 15. Trunks under 13 inches.

WHITE STAR LINE.

From Pier N. R. foot West 10th Street, New York to Liverpool, calling at Queenstown, every Wednesday. Rates, 1st cabin, on *Teutonic*, and *Majestic*, \$90, \$100, \$125, \$150; return 10 per cent. off double rates. 2nd cabin, \$40 and \$45; return, \$80 to \$90. Steerage, \$15. 1st cabin on *Britannic*, *Germanic*, *Adriatic*, \$60; return, \$110; under two years, free. No 2nd cabin on *Britannic* or *Germanic*; Steerage, \$10. Summer rates from New York, 18th April to 1st August. From Liverpool, 1st May to 1st November.

AMERICAN LINE.

From Pier 14, North River, New York, and Pier foot Grand Street, Jersey city, to Southampton every Wednesday. From Southampton every Saturday. Rates, to or from Southampton, London, or Havre, 1st cabin, *St. Louis*, *St. Paul*, \$85 and upwards; return \$153 and upwards, on *New York* or *Paris*, \$85; return, \$153 and upwards. Servants berthed in 1st cabin, \$75 each way. 2nd cabin, \$45; return, \$90 on *Berlin* and *Chester*, \$70; return, \$126 and upwards. 2nd cabin, \$35 to \$60; return, \$70 to \$120. Trunks for state-rooms not to exceed 15 inches high, 2 feet wide, 3 feet 6 inches in length. Steamer's chairs, 50c. Steerage, \$10 out, prepaid, \$15. Return tickets good on Red Star Line. Swift steamers run daily Southampton to Havre under six hours. Through rates to Paris, 1st class \$5. 2nd class, \$3.50. Passengers baggage bonded through to Paris without examination in England. Express train

¹ From Monthly Circular of D. Battersby, 184 St. James Street, Montreal.

leaves Havre at 8 A.M., due at Paris at 11.30 A.M. Summer rates, fr New York, May 1 to July 31. From Southampton, July 16 to October 18.

ALLAN LINE.

From Montreal to Liverpool at daylight every Saturday, and Quel following morning. All steamers call at Rimouski and Londonderry except ss. *Laurentian* and ss. *Numidian*, and these steamers sail fr Quebec on the Saturday afternoon. Rates, 1st cabin on *Parisian*, \$160, \$75, \$90; return, \$100, \$110, \$135, and \$162. Other steamers \$50 to \$60; return, \$100 to \$110. Clergymen and their families, rebate 10 per cent. on \$60 rate. Children under two years, free. 2nd cabin Liverpool, Glasgow, Belfast, or Derry, \$30, and return, \$55. Childr under one year outward and prepaid, free. Steerage, from Montreal Liverpool, London, Queenstown, Derry, Belfast, or Glasgow, \$1 prepaid to Quebec, \$15. Bedding and all necessary utensils provided fr by both services.

Passengers go on board between 8 and 10 o'clock Friday night.

The *Laurentian* carries 1st cabin passengers only on the eastbow passage.

Bicycles \$2.50, Dogs \$5 to \$15. Baggage conveyed from landing stage to railway station at Liverpool free of charge for passengers going London.

ANCHOR LINE.

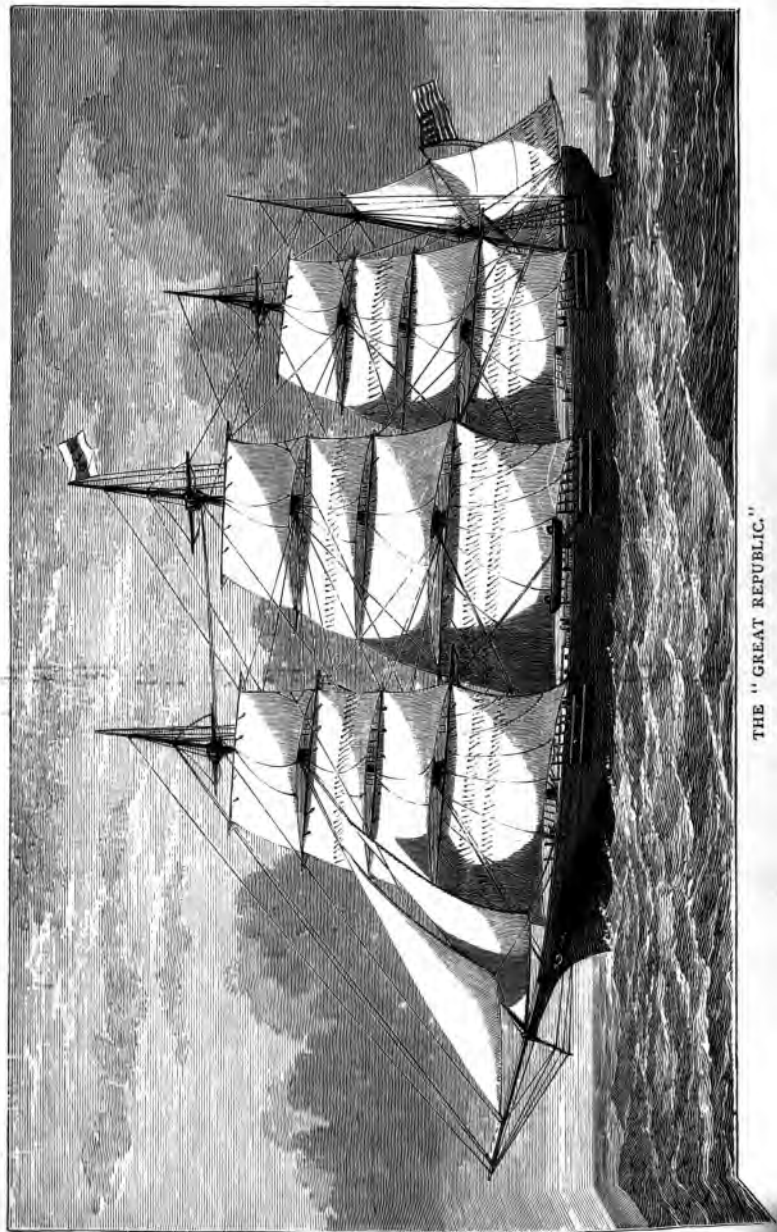
From Pier 54 N. R. foot of West 24th Street, New York, to Glasgow calling at Derry. From New York Saturdays. From Glasgow Thursdays. 1st cabin, \$45; return, \$90. Children under two years, free. 2nd cabin to Liverpool, Glasgow, or Derry, \$25; return, \$50 (under one year, free. Steerage, to or from Liverpool, Glasgow, Derry, Queenstown, \$10 Prepaid, \$15. Infants free; prepaid, \$3. Utensils and bedding provide free. By *City of Rome*, 1st cabin, \$60 to \$100. Return, \$120 to \$180 2nd cabin, \$25 and \$30. Return, \$50 and \$60.

Mediterranean Service.—To Genoa or Naples, 1st cabin \$60. Steerage \$22

DOMINION LINE.

From Montreal to Liverpool. SS. *Labrador* and ss. *Vancouver* a daylight on the Saturdays of sailing. Quebec at 2 P.M. same days. On ss. *Oregon*, *Mariposa*, and *British Prince* at daylight on the Fridays of sailing and Quebec at 2 P.M. same days. Passengers go on board evening previous to sailing. Rates, 1st cabin on *Labrador* \$60, \$75, \$90; return \$110, \$135, \$162; on ss. *Vancouver*, \$50, \$60, \$75, \$90; return, \$100 \$110, \$135, \$162. On ss. *Oregon*, *Mariposa*, and *British Prince*, \$50 and \$60; return, \$90 and \$110. Children under two years, free. Clergy men and their families a rebate of 10 per cent. except on lowest rate 2nd cabin, \$30; return, \$55, to Liverpool, Glasgow, Belfast and Derry Children under one year, outward or prepaid, free. Steerage from Montreal, \$15, to Liverpool, Derry, Glasgow, Belfast, or London prepaid, \$15. Bedding and utensils free. Infants, outward or prepaid free.

The ss. *Mariposa* and *British Prince* do not carry second cabin or steerage passengers. Baggage conveyed from landing stage to railway station at Liverpool free of charge for passengers going to London.



THE "GREAT REPUBLIC."

BEAVER LINE.

From Montreal to Liverpool every Saturday. 1st cabin, \$40, \$50; return, \$80, \$85, \$90, according to steamer. 2nd cabin, \$30; return, \$55. Steerage, \$15 to Liverpool, London, Glasgow, Londonderry, Queenstown.

NORTH GERMAN LLOYD SS. CO.

From Pier foot 2nd Street, Hoboken, to Bremen, calling at Southampton, every Tuesday and Saturday.

Express Service.—1st cabin to Southampton, London, Havre, or Bremen, \$60 to \$100; return, \$134.80 to \$196.30. To Paris, \$5 additional. 2nd cabin, \$50 and \$60; return, \$100 and \$110; steerage to Bremen, \$16 to \$18, prepaid, \$25 to \$32.50; return, \$38 to \$47.50, London or Southampton. Extra steamers to Bremen direct, 1st cabin, \$50. Infants, \$2 each way. (1) Summer season, May 1 to July 15. From Bremen or London, August 1 to October 15.

(1) New York to Southampton, seven days and less; Southampton to London, special train in two hours; Southampton to Bremen, twenty-four hours; Paris, *via* Havre, twelve hours. Stop over privileges at Southampton. Steamer for Havre leaves Southampton daily at 11 P.M.

Mediterranean Service.—Rates, 1st cabin, \$80 upwards; return 10 per cent. off return ticket. Stop over privileges allowed. Tickets good to return by Hamburg-American Packet Co.; all steamers stop at Gibraltar. No 2nd cabin from New York. Under one year, free. Steerage includes wine and bedding. Italian ports, \$20 and upwards.

Trunks should not be over twelve inches deep.

HAMBURG-AMERICAN SS. CO.

Rates, 1st cabin, \$95 to \$275; return, \$180.50 to \$522.50. 2nd cabin, \$60; return, \$120. Steerage to Hamburg, \$16 to \$18; to London, \$20.

Express Service.—From New York (Hoboken, N.J.) to Southampton, London, Havre, and Hamburg, every Thursday. Children between one and twelve years, half price. Servants receive 2nd cabin accommodation, but have access to 1st cabin.

Steamers go straight to dock at Southampton. No transfer by tender. Tickets to Paris *via* Southampton and Havre (boats daily). 1st class, \$5; 2nd class \$3. Time to Paris, twelve hours. Special train to London under two hours.

Regular Service.—From New York to Hamburg direct: five new twin screw mail and other steamers every Saturday. 1st cabin, \$50 and upwards; return, \$100. Intermediate, by the twin screw steamers, \$27.

APPENDIX No. 7.

BATTERSBY'S REGISTER OF THE OCEAN FERRY.

Compiled by D. BATTERSBY, Agent for all Trans-Atlantic Steamers, 184 St. James Street, Montreal.

* Twin screw; all others are single screw. † Triple expansion engines; all others have compound engines. ‡ Built of steel; all others are iron.

Name of Steamship.	Name of Line	Gross Tonnage	Indicated Horse-Power	Speed—Knots per Hour.	Length.	Breadth.	Depth.	Funnels.	Masts.	Passengers' Capacity.			Where Built: Year.
										First Cabin.	Second Cabin.	Steerage.	
Adriatic.	White Star	3,888	4,000	15	437	40	31	1	4	50	50	800	Belfast, 1871.
Aller †.	N. G. Lloyd	5,381	8,161	17†	438	48	34	2	4	150	90	1,000	Glasgow, 1885.
America	Thingvalla.	3,867	4,000	15	437	40	31	1	4	150	50	800	Belfast, 1872.
Amsterdam	Netherlands	3,664	2,000	13†	410	39	29	1	4	80	80	800	Ex-Celtic. 1879.
Anchor	Anchor	4,168	4,500	14	408	40	33	1	4	100	100	800	Ex-British-Crown. N. E. & B. [1887.]
Augusta Victoria *†	Hamburg	7,165	12,500	19†	460	56	38	3	3	220	120	800	Barrow, 1874.
Aurania †	Cunard	7,269	10,000	17	470	57	37	2	3	434	160	1,200	Stettin, 1883.
													Glasgow, 1883.
Belgenland	Red Star	3,602	...	14	402	40	30	1	4	...	...	...	Barrow-in-Furness, 1878.
Berlin †.	American	5,546	5,500	16	488	44	34	1	3	170	84	1,200	Greenock, 1874.
Bohemia.	Hamburg	3,410	1,600	10	351	40	30	1	2	20	20	800	N. E. & B., 1887.
Bothnia.	Cunard	4,535	3,000	14	422	42	34	1	3	330	50	1,100	Glasgow, 1874.
Britannic	White Star	5,604	5,000	16	455	45	33	2	4	220	220	900	Belfast, 1874.
Buffalo	Wilson	4,427	2,500	14	385	45	27	2	4	50	50	nil	Newcastle, 1885.
Campania * †	Cunard.	12,950	30,000	21†	620	65	43	2	2	600	400	1,000	Govan, 1892.
Chester	American	4,770	4,500	15	444	44	34	2	3	152	72	1,400	Greenock, 1873.
Circassia	Anchor.	4,272	4,500	14	399	42	33	1	3	140	75	800	Barrow-in-Furness, 1878.

Circassian	Allan	3,724	3,500	13½	415	40	33	1	3	72	75	850	1872.
City of Rome	Anchor	8,144	11,500	17	56½	52	37	3	4	75	250	1,000	Barrow-in-Furness, 1881.
Colorado	Wilson	4,220	2,500	14	370	44	28	1	3	425	nil	800	Hull, 1887.
Columbia * †	Hamburg	7,165	13,500	16½	463	56	38	3	3	220	120	800	Birkenhead, 1883.
Dania	Hamburg	4,379	3,300	14	..	..	..	1	2	230	nil	1,000	Stettin, 1883.
Devonia	Anchor	4,270	4,500	14	400	42	35	1	3	60	104	1,800	Barrow-in-Furness, 1877.
Dominion	Dominion	3,175	2,000	11	335	38	32	1	3	130	130	1,000	Dumbarton, 1874, N. E. & B., 1890.
Ens	N. G. Lloyd	5,192	7,405	17	420	47	34	2	4	125	130	1,000	Glasgow, 1884.
Ehispia	Anchor	4,005	4,500	14	402	40	33	1	3	110	110	800	Glasgow, 1873.
Eirura †	Cunard	7,790	15,000	20	511	57	38	2	3	650	160	250	Glasgow, 1884.
Friesland †	Red Star	6,700	..	15	450	51	38	1	4	226	102	600	Glasgow, 1883.
Fulda	N. G. Lloyd	5,124	6,474	17	429	45	35	2	4	125	130	1,000	Glasgow, 1882.
Furnessia	Anchor	5,495	6,000	14	445	44	34	2	2	250	215	1,000	Barrow-in-Furness, 1883.
Fürst Bismarck *	Hamburg	8,250	16,000	20	500	57	34	3	2	300	..	800	Stettin, 1871.
Gallia	Cunard	4,809	5,000	15	430	44	34	1	3	330	50	1,100	Glasgow, 1872.
Gellert	Hamburg	3,533	3,000	14	374	40	32	2	4	200	nil	800	Glasgow, 1874.
Germanic	White Star	5,008	5,000	16	455	45	33	2	4	220	nil	900	Belfast, 1874.
Havel	N. G. Lloyd	6,966	12,500	19	487	52	38	2	3	..	..	..	Stettin, 1870.
Hekla	Thingvalla	3,258	..	13	333	41	29	1	3	50	50	900	Green ck, 1884.
Island	Thingvalla	2,844	..	13	324	39	29	1	3	50	50	900	Copenhagen, 1882.
Italia	Hamburg	3,493	2,200	11	343	43	24	1	2	nil	nil	1,200	Newcastle, 1889.
Kaiser Wilhelm II †	N. G. Lloyd	6,990	6,000	15½	450	51	37	2	4	120	80	1,000	Stettin, 1883.
Laurentian †	Allan	4,522	3,500	13½	400	42	35	1	2	..	..	..	Greenock, 1872.
La Bourgogne †	French	7,303	8,100	18	492	52	38	2	4	301	66	580	La Seyne, 1886.
La Bretagne †	French	6,920	8,100	18	492	51	36	2	4	402	60	598	Penhoet, 1886.
La Champagne †	French	6,920	8,100	18	492	51	36	2	4	389	64	688	Penhoet, 1886.
La Gascoigne †	French	7,303	8,100	18	492	52	38	2	4	91	66	580	La Seyne, 1886.
La Touraine	French	9,239	13,000	19	520	56	34	3	3	..	..	..	St. Nazaire, 1890.
Jan †	N. G. Lloyd	9,310	9,310	18½	448	49	34	2	4	50	90	1,000	Glasgow, 1887.
La Normandie †	French	6,217	7,000	17½	459	49	37	2	4	195	70	84	Barrow-in-Furness, 1883.
Lucania * †	Cunard	12,950	30,000	22	630	65	43	2	4	600	400	1,000	Govan, 1873.
Labrador	Dominion	3,500	3,500	15	400	47	32	1	4	100	50	1,000	Dumbarton, 1881.
Lybian Monarch	Wilson	3,987	2,000	12½	360	43	32	1	4	40	30	1,000	Dumbarton, 1881.

N. E. & B., 1893.
[Polynesian.]

BATTERSBY'S REGISTER OF THE OCEAN FERRY—Continued.

Name of Steamship.	Name of Line	Gross Tonnage.	Indicated Horse-Power.	Speed—Knots per Hour.	Length.	Breadth.	Depth.	Funnels.	Masts.	Passengers' Capacity			Where built: Year.
										First Cabin.	Second Cabin.	Steerage.	
Maasdam	Netherlands	3,797	3,000	15	420	41	31	1	4	150	60	800	Ex-Republic. N. E. & B., 1880.
Majestic * †	White Star	9,861	16,000	20	582	57	30	2	4	300	170	850	Belfast, 1882.
Manitoba	Atlantic Trans.	5,590	3,600	14	445	49	30	1	4	..	..	..	Belfast, 1882.
Massachusetts *	Atlantic Trans.	5,590	3,600	14	445	49	30	1	4	..	..	..	Belfast, 1882.
Mobile *	Atlantic Trans.	5,590	3,600	14	445	49	30	1	4	..	..	..	Belfast, 1882.
Mohawk *	Atlantic Trans.	5,575	3,600	14	445	49	30	1	4	100	nil	1,000	Glasgow, 1881.
Mongolian †	Allan	4,809	4,000	13†	400	45	34	1	2	100	200	1,000	Glasgow, 1883.
Moravia	Hamburg	3,739	1,940	10	361	40	30	1	2	40	..	..	Glasgow, 1883.
New York * †	American	10,499	18,000	20	527	63	69	3	3	540	200	1,000	Glasgow, 1888.
Noordland †	Red Star	5,212	2,500	13†	400	47	35	1	4	..	..	..	Birkenhead, 1883.
Norge	Thingvalla	3,360	1,600	13	340	40	34	1	3	50	150	900	Glasgow, 1881.
Normannia * †	Hamburg	8,250	16,000	19†	520	59	38	3	2	300	..	800	Glasgow, 1880.
Numidian †	Allan	4,997	4,000	13†	400	45	34	1	2	100	80	1,000	Glasgow, 1881.
Obdam	Netherlands	3,657	2,000	14	410	39	29	1	4	80	60	800	Ex-British Queen. N. B., 1883.
Oregon	Dominion	3,712	4,500	13†	360	40	39	1	2	80	200	1,200	Dumbarton, 1885.
Paris * †	American	10,500	18,000	20	527	63	69	3	3	540	130	1,000	Glasgow, 1889.
Parisian †	Allan	5,359	4,500	15	440	46	33	2	4	250	..	1,000	1881.
Palatia	Hamburg	7,118	5,500	13	460	52	35	..	..	..	..	2,500	Germany, 1894.
Paria	"	7,118	5,500	13	460	52	35	..	..	..	..	2,500	Germany, 1894.
Persia	"	6,000	5,000	13	445	50	34	..	..	..	..	2,500	Belfast, 1894.
Phoenicia	"	7,118	5,500	13	460	52	35	..	..	..	..	2,500	Germany, 1894.
Prussia	"	6,000	5,000	13	445	50	34	..	..	..	..	2,500	Belfast, 1894.
Pennland	Red Star	3,760	1,800	13	361	41	26	1	3	..	..	..	Ex-Algeria. N. E. & B. [1882.
P. Caland	Netherlands	2,564	..	10	350	38	27	1	3	..	..	..	Glasgow, 1874.

Persian Monarch	Wilson	3,993	2,000	124	360	48	32	1	4	60	20	1,000	Dumbarton, 1880. Hamburg, 1883. Barrow-in-Furness, 1879. Ex-British Empire, N. E. & B., 1886. Stettin, 1882. Stettin, 1889.
Rheta	Hamburg	3,553	2,000	12	431	43	29	1	3	100	nil	800	
Rhynland	Red Star	3,689	1,600	124	402	40	30	1	4	..	..	..
Rottendam	Netherlands	3,329	2,000	131	390	38	27	1	4	70	70	800	
Regia	Hamburg	3,467	2,000	11	357	43	28	1	3	100	nil	800	
Russia	Hamburg	4,017	3,300	13	..	..	..	1	2	30	nil	1,400	
Seale & Co.	N. G. Lloyd	5,381	8,000	174	439	48	34	2	4	150	90	1,000	Glasgow, 1886.
Sardinian	Allan	4,376	4,000	14	400	42	34	1	3	206	75	900	1875. N. E. & B., 1890.
Sarmatia	Dominion	3,647	3,500	131	370	42	35	1	3	200	75	850	1871. Dumbarton, 1882.
Scandia	Hamburg	3,726	4,500	134	360	40	32	1	2	80	60	1,200	Stettin, 1889.
Servia	Cunard	4,375	3,300	13	..	..	..	1	2	30	nil	1,400	Stettin, 1889.
Spartan	Netherlands	7,392	10,000	17	515	52	37	2	3	402	160	200	Glasgow, 1881.
State of California	Allan State	4,368	3,000	15	430	42	32	1	4	80	..	800	1881. Ex-Arabia.
State of Nebraska	Allan State	4,275	4,000	14	385	46	33	1	3	..	..	..	Glasgow, 1891.
Spree	N. G. Lloyd	3,986	3,500	134	385	46	32	1	3	175	nil	826	Glasgow, 1880.
St. Louis	American	6,964	12,500	14	487	52	38	2	3	..	..	..	Stettin, 1890.
St. Paul	American	11,000	20,000	214	534	63	42	2	2	320	203	800	Philadelphia, 1894.
Suevia	Hamburg	11,000	20,000	214	534	63	42	2	2	320	203	800	Philadelphia, 1894.
Teutonic & Co.	White Star	3,009	2,000	13	364	41	33	1	2	150	..	700	Greenock, 1874.
Thingvall	Thingvall	9,686	16,000	20	582	57	39	2	3	300	170	850	Belfast, 1889.
Toronto	Dominion	2,324	..	13	301	37	30	1	3	50	50	500	Copenhagen, 1874.
Trave & Co.	N. G. Lloyd	3,345	3,000	11	329	39	32	1	2	30	nil	1,000	Dumbarton, 1885.
Umbria	Cunard	5,361	8,000	174	438	48	34	2	4	150	90	1,000	Glasgow, 1886.
Vancouver	Dominion	7,738	15,000	20	501	57	38	2	3	650	165	250	Glasgow, 1884.
Vendland	Netherlands	5,217	4,000	15	430	45	33	2	4	200	120	1,500	Dumbarton, 1884.
Waesland	Red Star	3,797	3,000	15	420	41	31	1	4	150	60	800	Belfast, 1871. Ex-Baltic.
Werkendam	Netherlands	4,752	..	14	435	41	35	1	4	..	..	..	Glasgow, 1867. Ex-Russia.
Werra	N. G. Lloyd	3,559	2,000	14	410	39	29	1	4	80	80	800	Belfast, 1882. Ex-British King, N. E.
Westernland	Red Star	5,109	6,408	17	433	45	36	2	4	125	130	1,000	Glasgow, 1867. N. E. & B., 1880.
Wieland	Hamburg	5,736	3,750	14	440	47	35	2	2	200	..	..	Birkenhead, 1883.
		3,504	3,000	14	384	40	32	2	2	..	..	800	Glasgow, 1874.

APPENDIX No. 8.

A MONTH'S OCEAN STEAMSHIP SAILINGS, NEW YORK
AND MONTREAL.*Regular Lines.*

OCEAN STEAMERS.

Dates of Departure from New York.

Steamer.	Sails.	Destination.
Normannia	April 25	Southampton
Etruria	" 27	Liverpool
Mississippi	" 27	London
Colorado	" 27	Hull
State of Nebraska	" 27	Glasgow
Ethiopia	" 27	Glasgow
Fulda	" 27	Bremen
Prussia	" 27	Hamburg
Amsterdam	" 27	Rotterdam
Champagne	" 27	Havre
Trave	" 30	Bremen
New York	May 1	Southampton
Adriatic	" 1	Liverpool
Westernland	" 1	Antwerp
Ontario	" 1	London
Campania	" 4	Liverpool
Mohawk	" 4	London
Furnessia	" 4	Glasgow
Ems	" 4	Bremen
Phoenicia	" 4	Hamburg
Maasdam	" 4	Rotterdam
Bourgogne	" 4	Havre
Kaiser William II.	" 4	Genoa
Havel	" 7	Bremen
Paris	" 8	Southampton
Teutonic	" 8	Liverpool
Noordland	" 8	Antwerp
Columbia	" 9	Southampton
Umbria	" 11	Liverpool
State of California	" 11	Glasgow
Mobile	" 11	London
Persia	" 11	Hamburg
Obdam	" 11	Rotterdam
Normandie	" 11	Havre
Saale	" 14	Bremen

OCEAN STEAMERS—*continued.**Dates of Departure from New York.*

Steamer.	Sails.	Destination.
Britannic	May 15	Liverpool
Berlin	" 15	Southampton
Waesland	" 15	Antwerp
Augusta Victoria	" 16	Southampton
Lucania	" 18	Liverpool
Massachusetts	" 18	London
Circassia	" 18	Glasgow
Palatia	" 18	Hamburg
Spaarndam	" 18	Rotterdam
Touraine	" 18	Havre
Lahn	" 21	Bremen
New York	" 22	Southampton
Friesland	" 22	Antwerp
Majestic	" 22	Liverpool
City of Rome	" 25	Glasgow

Montreal and Liverpool.

Steamer.	Line.	From Montreal on or about
Mariposa	Dominion	May 2
Baltimore	Johnston	" 3
Sardinian	Allan	" 4
Labrador	Dominion	" 11
Laurentian	Allan	" 11
Parkmore	Johnston	" 11
British Prince	Dominion	" 16
Parisian	Allan	" 18
Lake Superior	Beaver	" 20
Mentmore	Johnston	" 21
Vancouver	Dominion	" 25
Mongolian	Allan	" 25
Lake Winnipeg	Beaver	" 29
Oregon	Dominion	" 30
Barrowmore	Johnston	" 31

Montreal and Glasgow.

Pomeranian	Allan	" 5
Alcides	Donaldson	" 8
Sarmatian	Allan	" 12
Tritonia	Donaldson	" 15
Buenos Ayrean	Allan	" 19
Concordia	Donaldson	" 22
Norwegian	Allan	" 26
Amarnythia	Donaldson	" 29

OCEAN STEAMERS—*continued.**Montreal and London.*

Steamer.	Line.	From Montreal on or about
Austrian	Allan	May 4
* Hurona	Thomson	„ 10
Merrimac	Can. Transport	„ 11
Monte Videan	Allan	„ 15
Assaye	Can. Transport	„ 18
* Gerona	Thomson	„ 24
Monrovia	Can. Transport	„ 25
Brazilian	Allan	„ 29

* Proceeding from London to Newcastle with cargo.

Montreal and Bristol (Avonmouth Dock).

Dominion	Dominion	„ 7
Memphis	Dominion	„ 14
Mexico	Dominion	„ 21
Etolia	Dominion	„ 28

Montreal and Manchester.

Cynthiana	Furness	„ 4
---------------------	-------------------	-----

And fortnightly thereafter.

Montreal and Leith.

Fremona	Thomson	„ 10
-------------------	-------------------	------

Montreal and Dundee.

Avlona	Thomson	„ 10
------------------	-------------------	------

Montreal and Aberdeen.

State of Georgia	N. of Scotland	„ 5
Escalona	Thomson	„ 20

Montreal and Belfast.

Inishowen Head	Head	„ 15
--------------------------	----------------	------

Montreal and Dublin.

Bengore Head	Head	„ 10
------------------------	----------------	------

Montreal and Hamburg.

Christiania	Ham. Am. P. Co.	„ 8
Scotia	Ham. Am. P. Co.	„ 22

APPENDIX No. 9.

PRESENTATION TO CAPTAIN MURRELL.

(From the London Times, 31st May, 1889.)

The Egyptian Hall of the Mans on House was crowded on Friday on the occasion of the presentation by the Lord Mayor of public testimonials from England and America to Captain Murrell, the officers and crew of the *Missouri*, for their heroic conduct in rescuing the passengers and crew, 735 in number, from the sinking emigrant ship *Danmark*. Three bands from naval schools attended. The utmost enthusiasm prevailed throughout the ceremony, and those in whose honour it was intended received a complete ovation. Captain Murrell and his officers occupied seats to the right of the Lord Mayor in front of the platform, and behind Captain Murrell sat his parents. The Lord Mayor having briefly opened the proceedings, Mr. W. Connolly (Hon. Sec. of the fund) made, on behalf of the committee, a brief statement. The committee had decided that each member of the crew should receive two months' pay; that each officer and the steward should receive a gold watch and two months' pay; and that Captain Murrell should receive a silver salver with an inscription thereon and a cheque for the balance of the fund, which, it was hoped, would reach £500 before the lists were closed. On the previous night Captain Murrell had been entertained by the London Freemasons, and banquets, etc., also await him at Colchester (his birthplace) and Cardiff; while on his return to America he was to be summoned to Washington to be presented to the President of the United States.

Sir Henry Peek having moved a resolution offering the cordial congratulations of the citizens of London to Captain Murrell, his officers and crew, for their heroic conduct,

The Lord Mayor presented the testimonials, the inscription on the silver salver handed to Captain Murrell being as follows:—

"Presented with a purse of gold at the Mansion House, on the 24th May 1889, by the Right Hon. the Lord Mayor, on behalf of the citizens of London, to Captain Hamilton Murrell of the screw steamer *Missouri* in recognition of the British pluck and good seamanship displayed by him on the 6th April 1889, when in mid-Atlantic and in heavy weather, he was the means of saving, without casualty of any kind, the passengers and crew, 735 in all, of the sinking Danish emigrant screw steamer *Danmark*."

Captain Murrell having acknowledged the gifts,

Mr. M. H. Brooking, on behalf of Lloyd's, then presented a silver medal to Captain Murrell.

Mr. A. S. Williams then read a letter from Mr. William Brockie, chairman of the committee of the Philadelphia testimonial fund, stating

that \$3100 had been subscribed in that city. \$600 had been reserved for gold medals for the officers and silver medals for the crew, and the balance was transmitted to be distributed *pro rata* to Captain Murrell, his officers and crew. An address was then presented from the Shipmasters Society, and a letter from the Board of Trade. A sealed letter from Prince Bismarck addressed to Captain Murrell was then opened by the latter.

APPENDIX No. 10.

U.S.M.S. "NEW YORK,"

April 26th, 1895.

DINER D'ADIEU.

- | | | | |
|-------|-------------------------------------|-----------------------|--------------------------|
| 6.30. | Oysters on Shell. | | |
| | SOUPS. | | |
| 6.40. | Clear Turtle. | Consomme Comtesse. | |
| | Radishes. | Conapes of Anchovies. | Olives. |
| 6.50 | Salmon, Sauce Hollandaise. | | |
| | Boiled Potatoes. | Cucumber. | |
| 7.0 | Tenderloin of Beef à la Bordelaise. | | |
| | Artichoke Chips. | | |
| 7.10 | Sweetbreads en Caisses. | | |
| 7.20 | Saddle of Mutton, Sauce Chevreuil. | | |
| | Roast Potatoes. | Sea Kale à la Crème. | |
| 7.30 | Roast Forced Capon. | | |
| | Saratoga Chips. | Spinach. | |
| | Salade de Laitue et Tomates. | | |
| 7.40 | Marlborough Pudding. | | |
| | Petits Fours. | Genoese Pastry. | |
| | Fruit Jellies. | | |
| | Ice Cream. | | |
| | Pont l'Eveque Cheese. | | |
| | Bananas. | Oranges. | Dates. Filberts. Grapes. |
| | Apples. | Raisins. | Jordan Almonds. |
| | Cafe Noir. | | |

Steerage Bill of Fare, 21st April, 1895.

8 A.M. Coffee, sugar, milk, hot rolls, butter, Irish stew.

10.30 A.M. Beef tea.

1 P.M. Fresh soup, fresh meat, haricot sauce, boiled potatoes, plum pudding.

6 P.M. Tea, milk, sugar, fresh bread and butter, marmalade, oatmeal gruel.

APPENDIX No. II.

"LUCANIA'S" GREAT RUN.

Beats her own Record for Daily Speed and over the long Southerly Course.

QUEENSTOWN, May 24.—*Lucania*, the Cunard Line steamship, Captain McKay, from New York on May 18, has arrived here and has beaten her speed record. From the time she left Sandy Hook, about twenty minutes ahead of the cruiser *New York*, the officers of the Cunarder did not see the warship, which, according to a report which has been denied, was to race her either across the Atlantic or as far as the banks of Newfoundland. The *Lucania* made the trip in 5 days 11 hours and 41 minutes, being 3 hours and 3 minutes behind her own eastward record of 5 days 8 hours and 38 minutes, made in September, 1894. But on the trip just completed the *Lucania* made an average daily speed of 22'01 knots an hour. Her best previous daily speed record was 21'89 knots, made in June, 1894.

The *Lucania*, according to her log, passed Sandy Hook lightship at 2.24 P.M. on Saturday, May 18, and arrived off Daunt's Rock at 6.40 A.M. to-day. Her daily runs were 431, 505, 524, 522, 517, and 398. In latitude 48° 35' north, and longitude 29° 45' west, she passed a derelict whose timbers were showing six feet above water. On May 20 (Monday) the steamer met with much ice.

While the present trip of the *Lucania* is three hours and three minutes behind her best eastward record, she has lowered her own eastern record over the long southerly course. When the *Lucania* made her record of 5 days 8 hours and 38 minutes she covered only 2810 knots, while on the voyage just completed she steamed 2897 knots. Had the *Lucania* gone over the short course and made a speed of 22'01 knots an hour, her time would have been 5 days 7 hours and 40 minutes, or fifty-eight minutes better than her present record.

APPENDIX No. 12.

IMPROVED TRAIN SERVICE AT LIVERPOOL.

Transatlantic passengers now find a long-felt want supplied in Liverpool, as they are able to proceed by rail direct from the landing stage by the London and North-Western Railway to London and other places, thus avoiding the trouble of transit across Liverpool in 'buses and cabs. A commodious new station will shortly be opened at the Liverpool landing stage, and passengers will pass at once into the London and North-Western trains, which will be in waiting for their accommodation, ready to start right for London. These trains will be composed of the dining cars, corridor cars, and saloon carriages. The corridor cars are divided into sections, and the other saloons will be found to be most convenient for private parties. These special cars and compartments may be engaged, and seats may be reserved in the corridor and dining cars, on application to the railway company's officials, who meet all steamers at Queenstown, and at the landing stage, Liverpool. Similarly, the London and North-Western special trains, which are run from London to connect with steamers sailing from Liverpool, will travel direct to the new station at the landing stage there, and passengers will simply have to walk across the stage on to the tender. Later on, when the lengthening of the landing stage is completed, the ocean steamers will come right alongside the stage, and thus even the inconvenience of conveyance to and from the steamer by tender will be avoided.

APPENDIX No. 13.

POOR STEAMSHIP BUSINESS.

(*"Holland" in Philadelphia Press.*)

Those who have recently returned from Europe are telling with a good deal of interest of the very great and expensive improvements which the abandonment of Liverpool as its European terminal by the American Line compels. When the American Line made Southampton its port, Liverpool was mightily alarmed, and its commercial interests saw that unless great sums of money were expended in improving the landing facilities at Liverpool, that city would be likely to lose other transatlantic lines. The work has been done at enormous cost, and it is claimed that it is so done

as to make it possible for passengers and mails to reach London by the Liverpool route more quickly than can be done by the Southampton one. When these new facilities were thrown open with formal ceremonies on Wednesday, week before last, Mr. Ismay made an astonishing speech. He said that he had learned that in the year 1894, on a capital of over \$24,000,000, representing seven companies in the transatlantic trade, all of them with their American port at New York, not one penny dividend was paid, and that of these seven companies, four had not paid a dividend in the last three years, while the amount earned was insufficient to meet the shrinkage of capital resulting from a depreciation of the steamship. While it was known here that the earnings of the transatlantic steamships were so inconsiderable, competition being so great and business so divided as to make it unlikely that any new steamship lines would be established, still the impression was that the condition was not so bad as it was represented by Mr. Ismay in his speech to be. While he did not say it in so many words, yet he intimates that the improvement in the dock facilities, and the shortening in the time from Liverpool to London, would be likely to result in economies which might make it possible, with improved business, for the steamship companies to do better than they have since the Baring failure.

INDEX.

- Aaron Manby*, the first iron steamship, 44
Abyssinia, 78
Acadia, 47, 62
Accommodation, the first Canadian steamboat, 31
Adriatic, 74, 165, 181, 191
Africa, 70
Aird, Captain A. D., 159
Alabama, 241, 277, 283
Alaska, 50, 51, 65, 82, 196, 197
Albion, 138
Alcides, 259, 260
Aldershot, ss., 127
Aleppo, 77
Algeria, 78, 85
Allan, Captain Alexander, 138, 159
 —, Bruce, 158
 —, Sir Hugh, 139-159
 —, James, 158
Allan Line, 113; account of the ships of, 138-160; passage rates, 298
Aller, 229, 234
Almagro, navigator, 4, 14
Alps, 77
Alsace, 245
Alsatia, 189
Amarynthia, 259, 260
Amazon, 70
America, early discoverers of, 3-15; Sebastian Cabot the first discoverer of, 7-15; Civil War in, 24; shipbuilding in, 277-283
America, 66, 85, 105, 193, 194, 226
American colonies, the "Declaration of Independence," 23
American Steamship Co., 253, 264, 291-2, 312; passage rates, 297
Amerika, 266, 267
Anchor Line, 113, 187-189; passage rates, 298
Anchoria, 187, 189
Anderson, Captain, 105
Andes, 77
Anglia, 188
Anglo-Saxon, 143, 145
Arabia, 70
Arabic, 165
Arago, 66
Archimedes, the screw boat, 43, 46
Arctic, 69, 70, 73
Arizona, 82, 196, 197
Asia, 67, 70
Assyria, 189
Assyrian, 154, 157, 160
Atlantic, 69, 70, 165, 166
Atlantic steam navigation, epochs in, 32-53
Atlantic steamships, speed of, 284; traffic in, 1894, 291-2; sailings in one month, 306-308
Atlantic Transport Line, 268
Atlas, 77
Augusta Victoria, 211, 212, 215, 219
Aurania, 50, 51, 82, 102
Australasian, 78
Australia, 189
Austrian, 149, 160
Avlona, 261, 262

- Baltic*, 69, 165
Baltimore, 267
 l'ancroft, Mr., 282
Barcelona, 261, 262
Batavia, 77, 85
 Battersby's Register of the Ocean Ferry, 302-5
 Bayard, Hon. T. F., 283
 Beaver Line, 204-206; passage rates, 301
Belgenland, 251, 252
Belgian, 146
Belgic, 165, 181
Belgravia, 189
 Bell, Henry, and the *Comet*, 28, 29
 Belle Isle, Straits of, 145
 Bibby, Sons & Co., 255
 "Blackball" Line, 195
 Blake, Admiral, and the Dutch, 18
 Bliss, Mr., 61
Bohemia, 101
Bohemian, 143, 145
Bolivia, 187, 189
Borussia, 208
Bostonian, 266
Bothnia, 47, 79, 81
Bovic, 169, 181
 Bramah, Joseph, patent of, 27
Brazilian, 154, 160
 Breda, treaty of, 21
Bremen, 226
 Bristol, birthplace of Cabot, 7, 8, 12, 15
Britannia, 59, 62, 65, 121, 138, 189
Britannic, 81, 165, 167, 169, 181
 British Government; contracts with the Cunard Company, 66, 73; and American mails, 179, 180
British Princess, 253, 264
British Queen, 42
 British Seamen, 273-276
 British ships, number of, in 1701-2 . . . 22
 British ships, steam tonnage of, 278
Brooklyn, 201
 Brooks, Captain, 137
 Brown, Captain R., 159
 Brunel, Mr. I. K., and the *Great Eastern*, 182-186, 285; designs the *Great Britain*, 42, 43
Buenos Ayrean, steel ship, 49, 153, 160, 278
Buffalo, 265
 Bureau Veritas, 270
 Burns, George, 56, 57, 62; made baronet, 78
 Burns, Sir John, 82, 106
 Bute, Marquis of, 265
 CABOT, JOHN, navigator, 8-15, 22
 Cabot, Sebastian, discoverer of America, 7-15
 Caldwell, engineer, 105
Caledonia, 62, 138
California, 189
Cambria, 138, 188, 189
Cambrian, 65
 Cameron, Captain, 180
Campania, 86, 89-105, 107, 108, 177, 289
 Campbell, Lord, on Cabot, 15
 Canada, the steamboat in, 31
 Canada Shipping Company, 204-6
Canada, 66, 138, 192
Canadian, 140, 143, 144, 146, 149, 160
 Canadian Government and the mails, 156, 157
 Canadian Pacific Line, 254-258
Carmona, 261, 262
Car of Commerce, 31
 Carter, Mr., 263
Carthaginian, 153, 160
 Cartier, Jacques, navigator, 4, 11
Caspian, 146, 160
Catalonia, 86
 Cavendish, Thomas, 21
Celtic, 165, 169, 180, 267
Cephalonia, 86
Cevic, freightboat, 49, 169, 181
 Chamberlain, Mr. Eugene T., 278, 279
 "Chambers's Journal," article in, on the *Royal William*, 35-37
Charity, 140
Charlotte Dundas, the first steamboat, 27-29
 Chesapeake and Ohio Steamship Company, 269
Chicago, 195, 196
China, 77
Cimbria, 216
Circassia, 187, 189
Circassian, 50, 150, 160
Circe, 260

- City Line, 266
City of Antwerp, 113
City of Baltimore, 113
City of Berlin, 116, 137
City of Boston, 113, 114
City of Bristol, 113
City of Brooklyn, 113
City of Brussels, 50, 113, 114
City of Chester, 115, 137
City of Chicago, 50, 116, 127, 201
City of Glasgow, 112, 114, 139, 208
City of Limerick, 113
City of Lincoln, 195
City of London, 113, 114
City of Manchester, 112
City of Montreal, 114
City of New York, the first ship to adopt twin screws, 50, 51
City of New York, 86, 98, 113, 114, 119, 128, 131-7, 177, 180, 257
City of Paris, 50, 54, 86, 98, 113, 114, 117, 119-128, 131-7, 177, 180
City of Philadelphia, 113, 114
City of Richmond, 52, 115
City of Rome, 116, 187-189
City of Washington, 113
Cleopatra, 140
Clermont, the early steamboat, 28, 29
Colina, 259
 Collins, Mr. E. K., 66
 "Collins" Line, 66-74, 264
 Collisions at sea, 52
Colorado, 195, 196, 265
Columbia, 53, 62, 65, 189, 209-215, 219
Columbian, 266
 Columbus, 14; and America, 3, 4, 7, 10; visits Iceland, 11
Comet, first passenger steamboat, 28, 29, 32
 Compagnie Nationale de Navigation de Marseille, 268, 269
 Compound engine, the, 46-49, 81
Concordia, 259, 260
Connaught, 190, 191
 Cook, Captain James, 7
 —, Captain, 105
Coptic, 166, 181
Corean, 153, 157, 160
Corinthian, 146
 Cortez and Mexico, 4, 14
 Cramp, Mr. Charles H., 281-283
 —, Wm., 131, 279-281; ship-building company, 279-283
 Crane, Mr., 61
Crathie, 240
 Crimean War, Cunard boats employed as transports, 73; Allan boats, 140
 Cromwell, Oliver, and Navigation Laws, 18, 22; repeal of, 24
Cuba, 78
Cufic, 166, 181
 Cunard, Sir Edward, 78, 82
 —, Samuel, 55-106; made a baronet, 78
 —, Mr. William, 106
 — boats, the first, 47
 — Steamship Company, the, 55-111, 178, 212, 289; Report of the, 105-111; list of ships, 107; passage rates, 297
Cynthia, 149, 259, 260
 Cyprien Fabré Line, 269

Dakota, 196
 Dale, Mr., New York Agent of the Inman Line, 116
 Dampier, navigator, 7
 Dangers to which the ordinary screw steamship is exposed, 50
Danmark, 267, 309
 Davenport, Dr. Charles, 22
Davenry, 48
Denmark, 192, 194
Deodar, 261
 De Ruyter, defeat of, 21
Derwentholme, 260
Deutschland, 237
Devonia, 187, 189
 Dickenson, inventor of iron boats, 44
Dirigo, 278
Dominion, 198
 Dominion Line, 154, 157, 198-203; passage rates, 298
 Donaldson Line, 259, 260
 — Bros., 154
 Dow, William, 140
Dracona, 261
 Drake, Sir Francis, 4, 7, 22
 Dutch, England and the, 17-21

- Dutch East India Company, the, 17, 22
 Dutton, Captain J. E., 159
- EAGLE LINE, the, 211
Earl of Balcarras, East India Company's ship, 19
 East India Company, 21
Egypt, 192, 193
Eider, 229, 237
Elbe, 229, 234, 240; run down by the *Crathie*, 52
Elburkah, iron steamship, 44
Elysia, 189
 Empresa Insulano, 269
Empress of China, 254
Empress of India, 254-258
Empress of Japan, 47, 254, 257
Enis, 229, 234, 240
Enchantress, 48
 Engine, the compound, 46-49
Engineering; and loss of life at sea, 285; on traffic of Atlantic Steamship Lines, 291, 292
England, 192-194
 — and the Dutch, 17-21; and France, 22; maritime expeditions of, last century, 23
 —, United States trade with, 290; commerce of, 292, 295
 Epochs in Atlantic steam navigation, 32-53
Equador, 116
 Ericsson, John. and the screw propeller, 45, 46; and twin screws. 50; designs engine for *Massachusetts*, 65
Erie, 264
Erin, 192, 193
Erking, 263
Ethiopia, 187-189
Ethiopian, 203
Etruria, single screw ship, 50
 —, 82, 85, 86, 91, 102, 180
Escalona, 260-262
Europa, 66, 85
Europe, 63, 193, 194, 245
European, 146
 European and Australian Royal Mail Co., 78
 Exchange Shipping Co., 267
- FARON, Mr., 69
 Farralones, 65
 Fires at sea, 52
 Fitch, John, experiments on steam-boats, 27, 28
 Flinn, Main & Montgomery, Messrs., 198, 203
 Florence, commerce of, 1, 2
France, 192, 194
 France, seamen in, 275
Francis B. Ogden, 45, 46
Francisco, 265
Franklin, 66
Fremona, 261, 262
 French Line, 291
Friesland, 47, 251, 252
Frisia, 211
 Frobisher, 22, 23
Fulda, 85, 229, 234, 240
 Fulton, Robert, and the *Clermont*, 28, 29
Fulton, 66
 Furness Line, 267, 268
Furnessia, 187, 189
Fürst Bismarck, 212-219
- Galic*, 165, 181
Gallia, 81, 83
 Galway Line, 113, 191, 192
 Gama, Vasco de, navigator, 3, 14; his ship the *San Gabriel*, 5
Garry Owen, 44
 Genoese, trade of the, 1
Genova, 140
Georgian, 49, 266
Gera, 234, 240
Germanic, 81, 165, 169, 170, 181
Germany, 146
Gerona, 261, 262
Gladiolus, 286
Glamorgan, 265
 Gleadell, Captain, 180
Gothic, 166, 181
 Gondie, Mr. James, and the *Royal William*, 34
 Grace, Captain, 105
 Graham, Captain J., 159
 Graves, Mr. W. S., 181
 Gray, Thomas, 285
Great Britain, designed by Brunel, 33, 42-44, 46, 112, 263, 279

- Great Eastern*, 50, 51, 93, 105,
 182-186; Mr. Brunel and the,
 285
Great Republic, 299
Great Western, steamboat, 38-42
 Great Western Steamship Co., 42,
 43, 55, 61, 62, 264, 266
Grecian, 153, 160
Greece, 192-194
 Greenland, discovery of, 11
Grimm, 215
 Griscom, Mr. C. A., 115, 128
 Guion, Mr. Stephen B., 197
 Guion Line, 195-197, 212

 HAKLUYT, RICHARD, on early dis-
 coveries, 9
 Haliburton, Judge, 58
 Hamburg-American Packet Co.,
 113, 178, 207-225, 237, 276,
 291-2; passage rates, 301
Hammonia, 208
Hamilton, 202
 Hanoverian, 153, 155
Hansa, 226
 Hansa Line, 215
 Harland, Sir E. J., 82, 161, 162,
 165, 166, 170
 Harland & Wolff, Messrs., 201
 Harrison, Captain, 105
 Hart, Mr. Gerald E., on the dis-
 coverer of America 9
 Harvey, Rev. Mr., on Cabot's first
 voyage, 9, 10
Havel, 227-234
 Hawkins, Sir John, 4
Hecla, 77
Helvetia, 192, 193
 Henry, Prince, the "Navigator," 3
Herder, 216
Hermann, 65
Hesperia, 189
Hestia, 260
Hibernia, 65, 188, 190
Hibernian, 144, 160
 Hill, Chas., & Sons, 266
 Hill Line, 267
Holland, 192
 Holland, a great maritime power,
 17-21
 Holt, Alfred, and the compound
 engine, 46

 Howe, Hon. Joseph, 58, 61
 Howley, Rev. Dr., and the dis-
 coverer of America, 10
 Huddart, Mr. James, 157
Hudson, 226
Hugh Lindsay, 56
 Hulls, Jonathan, patent of, 26
Humboldt, 66
Hungarian, 143, 144
Hurona, 262

 ICELAND, Columbus visits, 11
Idaho, 50, 195, 202
Illinois, 131, 137, 253, 264
India, 189
 India, the East India Company,
 and, 21
Indian, 140, 143, 144
Indiana, 131, 137, 253, 264
Indrani, 260
 Inman, William, 112
 Inman and International Company,
 86, 112-137, 178, 212, 253
 International Navigation Co.; see
 Inman Line
Iona, 262
Ionic, 166, 181
Iris, H.M.S., first steel ship, 49
 Iron ships, some early, 44
 Irving, Captain, 180
 Ismay, Mr. Thomas H., 180, 275,
 313
 Ismay, Imrie & Co. (White Star
 Line), 161-181
Italia, 189
Italy, 192

Java, 78
 Jennings, Captain, 180
 Jennings, Captain of the *Circe*, 260
John Bull, 263
 Johnston, W. & Co., 267
 Jones, Captain, 197
 Judkins, Captain, 105, 126

Kaiser Wilhelm II., 229, 234,
 240
Kangaroo, 113
Kansas City, 266
 Kennedy, Captain, 137, 180

- Kensington*, 136, 137, 253
 Kohl, German geographer, on
 Cabot, 12
Labrador, 154, 202
La Bourgogne, 244
La Bretagne, 244
La Champagne, 244
 La Compagnie Générale Trans-
 atlantique, ships of, 242-247;
 balance sheet, 248, 249
La Gascogne, 244, 246
Lahn, 229, 234
 La Hogue, battle of, 22
Lake, steamers of the Beaver Line,
 204-6
L'Amérique, 245
La Navarre, 245
Lancastrian, 266
 Land, Captain, 137
 Lang, Captain, 105
La Normandie, 244
Lanson, 31
La Plata, 70
La Touraine, 245, 246
Laurentian, 149, 160
La Ville de Havre, 245
 Leitch, Captain, 105, 137
 Leyland Line, 265, 266
 Lina de Vapores Portuguezas, 269
 Lindall, Captain, 201
 Lindsay, Mr. W. S., on Cabot, 15,
 and the *Royal William*, 34, and
 the *Great Eastern*, 285
 Liverpool, improved train service
 to, 312, 313
 Liverpool & Great Western ss. Co.,
 see Guion Line
 Lloyd's Registry, 270
Loch Earn, 245
 "Lombards," commerce of the, 1
Lord Gough, 253, 264
 Lord Line, 268
Lord Londonderry, 268
Lorraine, 245
 Lott, Captain, 105
Louisiana, 192
Lucania, 53, 86, 89-105, 107, 108,
 177, 289; record runs of, 311
 Luce, captain of the *Arctic*, 73, 74
Lucerne 153, 160
 McIver, Charles, 57, 81, 82, 106
 ———, David, 56, 57, 62
 McKay, Donald, 283
 McLean, Captain N., 159
 McMicken, Captain, 105
 Magellan the navigator, 4
 Maginnis, Mr., 286
Main, 226
Majestic, 86, 98, 102, 128, 136,
 170, 173-181
Malta, 77
 Manhanset Line, 268
Manhattan, 195, 265
Manitoban, 146, 160
Marathon, 77
Margery, the first steamboat on the
 Thames, 29
 Marine steam engine, history of,
 25-30
 Maritime expeditions of England,
 last century, 23
Martello, 265
Massachusetts, 65
 Measurement of ships, system in
 Great Britain, 38
Medici, Cosmo de, 2
 ———, Lorenzo de, 2
Medway, 263
 Meier, Mr. H. H., 226
 Melvill, Mr., 56
Memphis, 198
 Mercantile Marine Act, 1854..274
 Merchant Adventurers' Company,
 13
 Merrifield, Mr., 48
 Miller Patrick, invention of, 27
Minneapolis, 53
Minnesota, 195, 265
Miwera, 258
 Mirehouse, Captain, 137
 Mississippi & Dominion ss. Co.,
 198
Mississippi, 198
Missouri, 267, 309
 Molson, John, and the *Accomm da-*
 tion, 31
 Monarch Line, 267
Mongolian, 47, 154, 160
Montana, 196
Monte Videau, 154, 157, 160, 202
Montreal, 198, 202
 Moodie, Captain, 105
Moravian, 141, 144, 146
Moselle, 226
 Murray, Captain George S., 197

- Murrell, Captain, presentation to, 309, 310
- NAPIER, DAVID, and the steam engine, 30
- Napier, Robert, 56, 57, 62
- Naronic*, 169
- Nasmyth, James, invents his celebrated steam-hammer, 43
- National Steam Navigation Co., 192-194
- Navigation Laws, Cromwell's, 18, 22; repeal of, 24, 282
- Navigators, some early, 1-15
- Navigazione Generale Italiana Line, 269
- Nebraska*, 195
- Nederland*, 251, 252
- Neptune Line, 269
- Nestorian*, 149, 160
- Netherland Line, 250
- Nevada*, 197, 202
- Newcomen, Thomas, improves Savery's engine, 26, 27
- New England, the Pilgrim Fathers in, 22
- Newfoundland, discovery of, 11
- Newfoundland*, 149, 160
- New York*, 113-137; dinner menu of, 310, 311; see also *City of New York*
- New York packet ships, the early, 23, 24
- Niagara*, 66
- Nicholls, Mr., on Cabot, 14
- Nomadic*, 166, 181
- Noordland*, 251, 252
- Normannia*, 212, 219
- Norse King*, 263
- North American*, 143, 146
- North American Transport Line, 250
- North Briton*, 143, 145
- North German Lloyd Co., 113, 178, 212, 226-241, 276, 291-2; ships of, 234; report for the year 1893..235-237; balance sheet, 238, 239; passage rates, 301
- Norwegian*, 144, 145, 153, 157, 160
- Nouvelle Campagne Bordelaise, 268
- Nova Scotian*, 143, 144, 155
- Numidian*, 154, 160
- Oceanic*, 162-165, 181
- Ocean King*, 263
- Ohio*, 131, 137, 251, 253, 264
- Olympia*, 189
- Olympus*, 77
- Ontario*, 198, 264
- Oregon*, 50, 52, 85, 197, 201, 203, 240
- Oriental*, 42
- Ottawa*, 140, 198, 201
- Pacific*, 69, 74
- Palatia*, 215, 219
- Palmyra*, 77
- Papin, first suggestor of the vacuum, 26
- Parana*, 190
- Paris*, 51, 53, 113-137, 284; see also *City of Paris*
- Parisian*, 150-153, 159, 160
- Parsell, Captain, 180
- Parthia*, 77, 85
- Passage rates, May 1895..297, 208, 301
- Passenger traffic on the Atlantic, 178, 179
- Patria*, 215, 219
- Pavonia*, 86
- Pearce, William, 82, 85, 196
- Pembroke*, 265
- Pennland*, 85, 251, 252
- Pennsylvania*, 131, 137, 192, 253, 264
- Perry, Captain, 180
- Persia*, 70-74, 126, 155, 178, 215, 219, 284
- Peruvian*, 50, 51, 144, 160
- Petroleum vessels, 269
- Petty, Sir Henry, 22
- Philadelphian*, 266
- Phœnician*, 144, 160, 215, 219
- Pickard, James, patent of, 27
- Pilgrim Fathers in New England, 22
- Pisa, ancient city of, 1
- Pizarro, founder of Lima, 4, 14
- Plimsoll, Mr., 274
- Polynesian*, 149, 259, 260
- Pomerania*, 216
- Pomeranian*, 153, 160
- Portuguese, early discoveries of the, 16, 17
- President*, 42
- Price, Mr. James, 197